HEALTH AND SICKNESS IN THE TROPICS

LEONARD BOSTOCK

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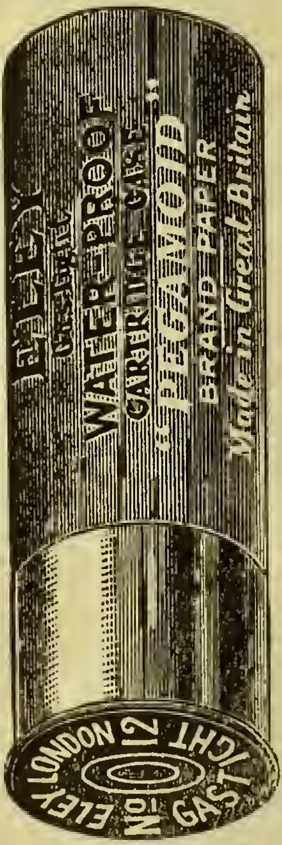

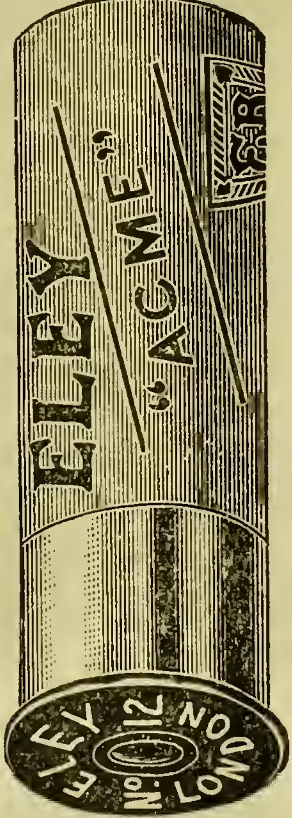

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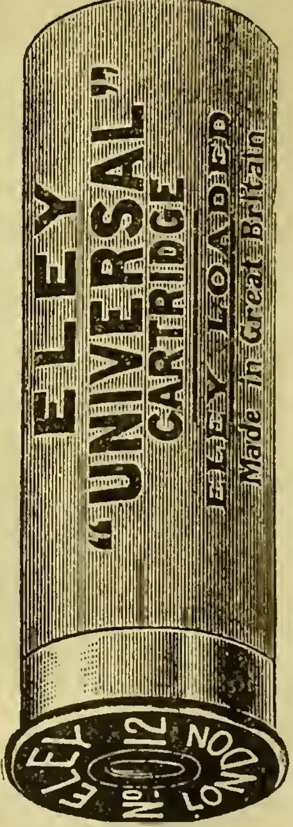

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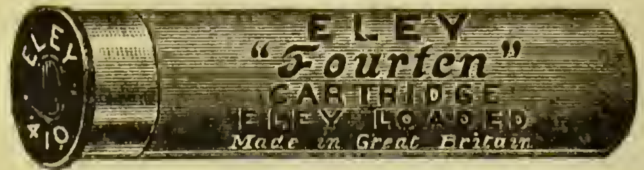

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HEALTH AND SICKNESS IN THE TROPICS

A GUIDE FOR TRAVELLERS AND RESIDENTS IN REMOTE DISTRICTS

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BY

LEONARD BOSTOCK

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PREFACE

This little book represents an effort to describe shortly, and in plain terms, the measures that may be adopted to preserve health in the tropics, and the treatment of some of the commoner diseases; and it is hoped that it may prove of service to some travellers, sportsmen, or pioneers, or to some who reside in remote districts of the tropics, beyond the reach of skilled medical assistance. Many tropical diseases are preventable; and much may be done to prevent trivial illnesses becoming serious. The writer's tropical experience is limited to Africa; but the principles laid down are applicable to all tropical countries.

Many authorities have been consulted in the preparation of these notes, and their works freely used. Some acknowledgments are made in the text; and the writer wishes to express his particular indebtedness for assistance derived from the writings of Sir Patrick Manson, Sir Ronald Ross, Professor Osler, and the many contributors to the "Index of Treatment" (Hutchinson & Collier) and the "System of Medicine" (Allbutt & Rolleston.)

For the rest, the opinions expressed are founded on the writer's own experience in Africa; and represent to a large extent the results of reflections on the consequences of mistakes committed by his friends and patients, or himself. Possibly something has been recorded which will assist the newcomer to avoid the pitfalls which beset the path of the unwary in the tropics.

LEONARD BOSTOCK.

Porto Amelia,
Portuguese East Africa.
January, 1913.

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PART I

HYGIENE

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RESIDENCE IN THE TROPICS FOR EUROPEANS

GENERAL OBSERVATIONS

THE average, healthy, normal-minded adult in temperate climates thinks little about his health ; nor does he need to. He has been accustomed from boyhood, maybe with the exception of a few short, sharp illnesses, to rise feeling "fit," and to get through a day's work or sport at the cost of no more than an almost pleasurable sensation of slight fatigue. The exercise of a little common sense, a few principles of conduct, and rules for clothing—maybe gleaned from the dicta of a wise mother—probably serve to safeguard his personal welfare. And for the rest, Public Boards and Committees, Municipalities and Councils, Medical Officers of Health, and Sanitary Inspectors labour to provide for him a pure food and water supply, fresh air, and sanitary surroundings, and to protect him from every possible ill or injury.

On proceeding to the tropics for the first time, it is well to reflect that, apart from the large centres, there will be found no Boards, Medical Officers, or Inspectors, and that the resident in the tropics, each man for himself, must be prepared to take their place to some extent, if he would retain his health. An intending emigrant should consult his usual medical adviser, and ascertain whether there is any weak spot in his constitution which requires special care, and throughout his residence in the tropics he should realise the necessity for a careful mode of life, if he would avoid disaster. A healthy, average man in the tropics can usually retain fair health if he will take care of himself, and even persons below the average health and constitution may fare as well as in Europe, or in some cases even better, if they will order their lives with care. Persons who are actually suffering from chronic diseases would be wise, if they leave Europe, to move to sub-tropical zones only ; and this is particularly true of consumptives. The strain of life in the tropics, and especially attacks of malaria, try phthisical patients too severely. For such the dry, warm, and healthy uplands of Australia or South Africa offer better prospects.

PERSONAL HYGIENE

Residence in the tropics is not really so very dangerous for the average European, but for the preservation of health rather more care is necessary than in temperate climates. The new-comer often views with contempt the precautions of the old resident, until perhaps bitter experience has taught him that carelessness in running unnecessary risks is not a token of manliness, but a proof of folly. Presently he learns that his health is his most valuable asset, and takes every reasonable precaution to protect it. To point out the precautions that should be observed is the object of the following pages ; each item will be dealt with separately, and under the section dealing with diseases will be found certain special precautions against some particular illnesses. The object of all these precautionary measures may be summed up in a phrase, " To keep fit, and avoid excess." Excessive eating or drinking will lead to disturbances of the liver and digestion ; excessive exposure to heat or midday light, excessive fatigue, dissipation, loss of sleep may, any of them, contribute towards the lowered vitality which often marks the first stage of the road towards the general and nervous breakdown which, apart from any actual illness, causes many persons to be invalided from the tropics. Further, lowered vitality means a lessened resistance against disease ; such persons fall easy victims to many illnesses or ailments, and their convalescence is frequently prolonged or incomplete. In reading the following notes, then, it may be remembered that they all point towards one goal, to protect the general health by adopting favourable measures and avoiding risks.

PERSONAL CLEANLINESS

Personal cleanliness is not actually essential to good health, for many dirty persons live to a hearty old age, but the elementary instinctive desire for cleanliness is possessed in a marked degree by many creatures, *e.g.* insects, birds, and cats, and by most savages, who at least wash themselves during hot weather ; and as Nature's instincts invariably indicate what is beneficial for the individual or his race, it may be safely assumed that cleanliness is conducive to man's well-being.

Amongst civilised beings the instinct has been developed into a habit, and most persons now take a bath once a day. In the tropics, where the profuse perspiration rapidly decomposes on the surface of the body, a daily bath will be found the minimum necessary to secure a reasonable certainty of not becoming an offence unto one's neighbour. How, when, and where, then, shall the bath be taken ?

Open-air bathing is seldom possible in the sea or large rivers, owing to danger from sharks or crocodiles, and if indulged in, must therefore be in small streams or pools. But here lurk other, invisible and less well known dangers, in the shape of risk of infection by "hook-worms," producing the disease sometimes called "tropical anæmia"; infection by Bilharzia worms, with inflammation of the bladder and blood-stained urine; and the various skin diseases, "ringworms," may possibly be conveyed by contaminated water. The smaller the stream, the more muddy and stagnant the pool, the more visited by natives and animals, the greater should be the objection to bathing therein on the part of Europeans. For these reasons, together with the risks of sunstroke, or severe sunburn, open-air bathing is to be deprecated in the tropics, and the bath should be taken indoors.

THE KIND OF BATH

In permanent abodes a bath long enough to lie in is desirable, as in such only can a hot bath be comfortably enjoyed, and after a long day's work or sport nothing is so refreshing to tired muscles as a prolonged hot bath; nor can it be easily dispensed with in cases of sickness. Many persons prefer the shower bath, claiming that they use clean water throughout. The long bath, the common oval tin bath, or the shower bath are all excellent, and the selection will depend upon circumstances or personal preference. The ideal plan is to have both the long bath and shower; when a hot bath can be followed by a few seconds' cold shower, if desired. The main point is to provide a plentiful supply of water to permit of the free use and removal of soap.

For the traveller various forms of portable baths are available, made of rubber or canvas ; while in the bush a very serviceable shower bath may be improvised from a five-gallon paraffin tin, by perforating the bottom with a number of small holes and hanging the tin in a tree ; the water being emptied from a bucket into the tin when the bather is ready for the douche.

THE KIND OF WATER FOR THE BATH

When available, rain water is the best, or hard spring water may be softened by previous boiling or with ammonia. The water from large or quickly running streams is likely to be pure, but water from small sluggish streams and from stagnant pools should be avoided, on account of the risks mentioned under open-air bathing. If no better water is obtainable, it should be boiled and allowed to cool.

SHOULD THE BATH BE HOT OR COLD ?

On this question there is considerable diversity of opinion ; and it may be noted that the new arrival from Europe usually prefers a cold bath, being, maybe, hardier than the old resident ; while the old resident usually prefers a warm bath, being, maybe, wiser than the new arrival. The writer is of opinion that the decision may safely be left to the individual, if the latter will conscientiously consider which temperature for the bath suits him best, and follow his own natural instincts and sensations. If there is a real desire for a plunge into cold water in the morning, and the bather emerges bright and well, and is quickly warm again, there is nothing to be said against it ; but if the bather, after shrinking on the brink of his tub, plunges desperately in from a misguided sense of heroism, to emerge shivering, with blue nose and fingers, he certainly is running grave risk of paying dearly for his folly. In the same way, on coming in from work or sport, flushed and heated, and pouring with perspiration, one's thoughts turn at once with longing to a cold plunge, and it may safely be taken—if taken immediately ; but to sit down to cool off in a breeze, and leave the cold bath until the body is already chilled is highly dangerous. In brief, a cold bath is safe when the bather is warm, and knows from experience that he will not feel cold afterwards.

The above is written for the average, healthy, robust adult, but for young children and the aged, for invalids and convalescents, for old residents—whose health and vitality have suffered from repeated attacks of fever or other illness, or merely from continued residence in a tropical climate—the matter is quite otherwise. In such cases the writer is convinced that the cold bath is dangerous, and would recommend hot, or at least tepid baths, or sponge down.

WHEN TO TAKE A BATH ?

Popular convenience and inclination have fixed the morning immediately on rising as bath-time, and for the warm or tepid bath there is no objection ; but this is just the hour when a shock is most severely felt, and the cold bath might better be postponed until the bather had fortified himself with a light breakfast. The evening is probably a better time than the morning, and many persons, whose circumstances and occupations permit, bath twice daily. In very hot weather, when one comes home wet, dusty, and tired after a day's work or sport, the evening bath and change before dinner act as an invaluable restorative.

CARE OF THE TEETH

A short note on this subject may not be out of place, as it frequently happens that persons who are scrupulously careful of their teeth while living in a house, neglect them when in the bush. The point is of some importance, as there occurs, in Africa at all events, very commonly a disease of the mouth, characterised by swollen and tender gums, with ulceration and discharge of pus from the sockets of the teeth. In a bad case the mouth becomes extremely foul and offensive ; the glands behind the ear enlarged and painful ; the teeth may become loose and fall out ; and the sufferer, unable to eat without pain, falls into a condition of serious illness. Such cases are nearly always due to want of cleanliness of the mouth, the decaying food offering a suitable cultivation medium for the growth of the bacteria causing the inflammation, and the thorough use of a toothbrush and a Condy's fluid mouth wash usually promptly ends the trouble. If a taint of scurvy is suspected as being concerned in the cause, a diet including plenty of fresh vegetables and fruit is indicated. It may be mentioned that in the tropics it is rare to find a dentist except in the large towns, and persons proceeding to remote districts for any lengthy period should invariably pay a visit to the dentist before leaving, to assure themselves that their teeth are in perfect order.

FOOD

In the tropics, where the temperature and humidity tend to produce a condition of general bodily and nervous exhaustion, greater effort should be made to secure a liberal and varied diet than is necessary in more temperate localities. So far as circumstances permit, meals should be daintily cooked and served, for thus is it possible to coax the failing appetite. Clean table linen and good glass and crockery are not out of place even on a shooting trip, and have their own value as one of the small aids towards the preservation of health. Enamel tin ware may be carried, but should only be used when every other utensil is broken.

The diet scale should include fresh meat, fresh vegetables, and fresh fruit. Owing to the difficulty of obtaining fresh vegetables and fruit, too much meat is often eaten. Canned goods may be used in the absence of fresh vegetables and fruit, but a point often overlooked is that natives, in nearly all parts, grow some native vegetables, some of which are palatable. Eggs, fowls, and goat milk, at least, can usually be obtained from native villages.

In general every ordinary article of diet may be freely enjoyed without hesitation, care being taken to avoid an excess of animal food. Pork is always open to suspicion in the tropics, as very few animals are sty fed entirely; with the result that many pigs suffer from "measles," and many human beings from tape-worm. A word of caution may be added with reference to the rapidity with which meat decomposes in hot countries, and the carelessness of native cooks, who seem, indeed, to take a pride in the economy which disposes of tainted meat in an entrée or curry, and in the culinary skill which disguises the taste of the main ingredient. Many cases of ptomaine poisoning arise in this way. It is well to keep a watchful eye on the kitchen and pantry.

A caution may be mentioned against overeating, which is probably responsible for more cases of illness than over-indulgence in alcohol. The habits of life in the tropics are apt to lead to self-indulgence, and in the matter of eating it is particularly the midday meal—late breakfast or lunch—which is often marked by lack of moderation. The spiced foods, curries, and condiments which are rarely absent from the breakfast-table in the tropics are, usually, merely a token of the jaded appetite, and flagging digestion, produced by overeating. Let the energetic, healthy young man eat what he likes ; if he eats too much his active habits are his safeguard. But as his years increase in number, and the inclination for active exercise diminishes, he should moderate his diet scale. In all climates most healthy men of middle age eat too much ; it is in the tropics that the injurious effects thereof are more easily recognised.

" Every wise man, after fifty, ought to begin to lessen at least the quantity of his Aliment, and if he would continue free of great and dangerous Distempers and preserve his Senses and Faculties clear to the last, he ought every seven years go on abateing gradually and sensibly, and at last descend out of Life as he ascended into it, even into the Child's Diet " (George Cheyne, from Professor Osler's " Principles and Practice of Medicine").

For the young, healthy man the following points are worth remembering. Fats, butter, and oils are heat-producing foods, and are little needed in hot countries ; they should therefore be taken in moderation. The reverse is also true ; on returning to a cold country after some years of residence in the tropics, a marked craving for fatty foods is often experienced, and may properly be gratified, being an indication of a physiological need. Stoutness is a greater affliction in the tropics than in a cold country, and a man who is inclined to become too fat may reduce his starchy foods such as rice, tapioca, macaroni, sago, potatoes, peas; pastry, sugar, and sweets; malt liquors and liqueurs.

The most essential articles of diet in the tropics will be found amongst meat, fish, eggs, milk, fruits, vegetables, native cereals, and bread, with all the starchy foods above mentioned, if not contra-indicated by reason of their fat-forming tendency.

MEAL HOURS

The midday hours in the tropics being unsuited for active employment for Europeans, on account of the heat, it is customary to commence the day early, and allow a long midday interval. In accordance with the hours of employment, the usual meal times are an early breakfast about 7, déjeuner about 11 or 12, and late dinner. Many residents omit the early breakfast entirely, taking only two meals a day. This plan provides quite as much nourishment as is necessary in hot countries, and every person will no doubt arrange his meal hours in accordance with his inclinations and occupations. On general principles, however, the writer questions the wisdom of entering on three or four hours' work without taking any food at all on rising, and suggests that most people would do better by partaking of a very light early breakfast, such as bread-and-butter and fruit. The habit of taking only two meals a day also naturally tends to cause the midday meal to be a hearty one, and throws too much work upon the digestive organs during the least favourable time of the day. The results are seen in lassitude, sleepiness, and mental ennui, and in later life various digestive derangements. Personal requirements vary so widely that it is impossible to be dogmatic on this subject; but each person can adopt those habits of eating which prove suitable to himself, and may remember that the chief error of dieting in the tropics lies in taking too large a meal at midday.

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DRINKING WATER

To secure a supply of pure drinking water becomes in the tropics a matter of the most supreme importance, and neglect to do so will almost inevitably be followed by serious illness. Cholera, dysentery, typhoid fever, and infection by "hookworms" and Bilharzia worms are spread chiefly, or almost entirely, by impure drinking water.

Rain water collected in covered tanks and spring water, where the water falls directly into a receiver, are alone above suspicion; but these sources of supply are not always available, and drinking water must often be drawn from large rivers, springs forming pools on the ground, small streams, wells, or stagnant pools. The order in which the list is given indicates also the increasing danger of using such waters for drinking purposes. In very dry districts water can often only be procured by digging holes in the bed of a dried-up stream, and if such a hole can be protected from fouling, the water is fairly pure as a rule, being filtered in passing through the sand.

To lay down a fixed rule on this subject, it may be said that: "All houses in the tropics should be provided with rain-water tanks, and all drinking water excepting rain water must be boiled." Boiling destroys all germs of disease, and freshly boiled water—no matter how dirty in appearance—may be drunk with impunity. It is a good rule when travelling to drink water only as weak tea, and the water bottles may be filled with the same beverage, without milk, but with sugar if preferred. Native servants may be lying when they assure one that the drinking water has been boiled and cooled, but as they cannot make tea with cold water, there is the assurance that at least part of the contents of the water bottle has been sterilised. But if possible, the sterilisation of drinking water should always receive the traveller's personal supervision.

FILTERS

THE VALUE OF FILTERS

Put not your trust in filters. A good filter in perfect order will return clear and sterile water; but a filter needs proper attention, and if allowed to become foul will return water clear in appearance, but containing, possibly, more germs than the original water put into it. Filters which are much out of order fail to return even clean water. Beware of the false sense of safety that lies in the expression "filtered water." There is a world of difference between dirty water, which, although open to suspicion, may contain no germs of disease, and water which is unfit for drinking in a medical sense. The latter may be perfectly clear and sparkling in appearance, and yet deadly, from the presence of germs. The function of a filter is to remove dirt, and only a very good one will do more. Drinking water, then, may be filtered to remove dirt, but must be boiled *afterwards*, to render it sterile with complete certainty.

Boiled water is somewhat unpalatable for drinking, and if this is a great objection, the difficulty may be overcome by the use of a sparklet bottle.

DRINKING-WATER VESSELS

In the tropics, whether in house or camp, some device is necessary for keeping drinking water cool. In many places, porous earthenware jars of native manufacture are procurable, and the evaporation of water from the outer surface keeps the contents pleasantly cool, especially if the vessel be placed in a breeze. A jar with a glazed outer surface is useless. Canvas bags serve the same purpose. The interior of such utensils should be cleaned occasionally with sand and boiling water. Failing either jars or canvas bags, any water bottle, wrapped in a wet cloth and placed in a breeze, will be cooled considerably below the temperature of the surrounding atmosphere.

In most settlements in the tropics which carry a small permanent population an ice factory will be found; and by using a little ice a convenient and ready method of cooling drinking water or minerals is afforded. But the consumption of beverages, iced down nearly to freezing point, is greatly to be deprecated. Drinks should, if possible, be palatably cool, but not very cold. A few remarks may be useful as to the time when to drink. When engaged in any outdoor occupation or travelling, the heat, and excessive perspiration consequent upon exertion, rapidly induce thirst; and if the water bottle is at once requisitioned, the amount consumed is immediately lost again by an increased flush of perspiration; and presently thirst, loss of energy, and lassitude are more marked than at first. The desire for another drink now becomes irresistible; perspiration is again increased, thirst quickly returns, and finally the traveller is drinking every few minutes, while the excessive perspiration saps his muscular energy and leads to early exhaustion. It is not difficult to resist the desire for the first drink, and with a little practice a habit of not drinking on the march is soon established. The discomfort of the first sensation of thirst shortly disappears, and perspiration remains within reasonable limits, while the onset of fatigue is postponed. He will travel the farthest and with the least distress who forms the habit of drinking freely only at the midday and evening camps. If thirst becomes intolerable, as much relief will be obtained from rinsing out the mouth and throat with a little water, and ejecting it, as from drinking. Cold tea, without milk or sugar, relieves thirst more quickly than water, if one must drink; while on reaching camp, few beverages are more grateful than dilute lime juice cordial. The use of alcohol on the march is utter folly.

THE USE AND ABUSE OF ALCOHOL

The observations of the writer cause him to believe that the rigid total abstainer who will not make use of alcohol, even in medicinal doses, does not fare so well in the tropics as the person who uses alcohol in strict moderation. On the other hand, he is of opinion that the great majority of residents in hot countries drink far too much. A man who is strong and healthy needs no alcohol, and is probably better without any; a man, tired out with work or heat, and whose vitality has been lowered by the depressing influences of life in the tropics, has an imperative need for an occasional stimulant; and as most people prefer whisky to sal-volatile, he will probably take the former, and with beneficial results, provided always his potations are strictly moderate. It is very noticeable how frequently temperate men, exhausted at the end of the day, from any of the above-mentioned causes, complain that they have no appetite for dinner ; and yet how constantly one glass of wine or spirits restores them to a feeling of well-being, and enables them to get through the meal satisfactorily. Unfortunately moderation is not the rule of the tropics ; the thirst induced by heat and excessive perspiration, the lenient standard of public opinion, the temptations of an inordinate number of bars and clubs, the social and hospitable habits of residents, the luxurious style of living, and the ease with which most young men earn an income higher than their actual requirements combine to develop a tendency towards excess. Medical men and laymen, therefore, should be very careful how they advise the use of alcohol in the tropics, and if they do so, should state an exact quantity as the maximum. Applying this rule to himself, therefore, the writer gives, as his opinion, one pint of beer or claret per day, and one bottle of whisky per week, as the maximum of alcohol which a healthy, active man can consume without risk of injurious effects ; and anything over the quantity stated should be considered intemperate drinking.

Delirium tremens and disease of organs, due to prolonged debauchery, do not concern us here ; but the minor effects of immoderate drinking are too common, and very obvious in the tropics. Bloatedness, impaired mental and bodily vigour, loss of appetite and failing digestion, which must be constantly goaded onwards with bitters and condiments, flabby muscles, and shortness of breath on exertion, owing to lack of heart, stamina, all tell their own tale to the observant eye. The drinking man cannot do a fair day's work in the heat of the tropics ; it is the drinking soldier who falls out on the march.

Apart from these general considerations there are at least three diseases of the tropics, the attacks of which are specially influenced by alcohol. Dysentery, abscess of the liver, and sunstroke, in the great majority of cases, select free drinkers as their victims; that is to say, free drinkers are particularly liable to these diseases, while temperate persons are comparatively immune.

The following may be taken as the rules that should govern the use of alcohol in the tropics:

1. Strict moderation.
2. Light beverages with meals during the day (light beers or claret).
3. No drinking between meals.
4. The use of spirits only in the evening when work and the heat of the day are over.

PUBLIC

CLOTHING

It is not easy to offer advice on the subject of appropriate clothing for the tropics, owing to the great diversity of opinion that obtains among careful and observant residents, both medical men and laymen, and to the great variety of fabrics obtainable. Garments of wool, cotton, linen, silk, and mixed fabrics all have their earnest advocates, both on the part of the manufacturer and the wearer. The fact is that the ideal fabric for tropical wear has yet to be discovered. It should not be too expensive, and should wash well; it should be porous and absorbent, to admit air freely to the surface of the body, and to soak up perspiration, otherwise the wearer lives in a constant steam bath, of which the garments form the walls; it should dry quickly, for the moisture of saturated garments conducts heat readily, and the wearer will be overheated while walking in the sun, and may take a chill when sitting in the shade; it should not be irritating to the skin; it should be thick enough for protection against the sun; sufficiently light in weight for comfort, and yet warm enough to guard the wearer against the risk of chill. This is to ask a great deal from a single fabric, and manufacturers have not yet succeeded in producing one which can fulfil all the requirements. Wool does not wash well, neither is it very absorbent; silk dries slowly, and when wet clings to one like a plaster; linen and cotton lack warmth. Many persons with delicate skins refuse to wear anything except silk or fine linen, on account of prickly heat being induced often by wool and occasionally by cotton. Most mixed fabrics are too heavy, too expensive, and neither wash nor wear well.

In temperate climates clothes are worn primarily for the sake of warmth, and our savage ancestors made themselves garments of skins. In the tropics many savages go nude, or almost nude, and their only marked physiological difference lies in the possession of a black, sun-proof skin. Here, then, lies a hint to the European to clothe himself during the heat of the day in garments which will not be too warm, but just thick enough to give protection from the sun. But in the evening when the sun is down, a cool breeze springing up, and the temperature falling suddenly perhaps twenty or more degrees, the savage is under much safer conditions than the European; for the naked skin of the savage has dried instantly, and he remains warm; while the European clothed from head to foot in garments sodden with perspiration represents exactly the process by which drinking water is cooled, by wrapping the bottle up in a wet cloth.

His body must supply the heat necessary to evaporate the moisture from his clothing, and until his garments are dry the chilling process proceeds. Only the most robust can brave this severe and rapid chilling with impunity, and its dangers are seen in the tropics in innumerable illnesses and relapses of malaria.

In most parts of the tropics the daily variation of temperature is more marked than in Europe—were it not so, life would be almost insupportable—the most trying experience being a hot night following a hot day. At high altitudes, and at the coast when the breeze comes off the sea at night, the sudden drop in the temperature at sundown may amount occasionally to upwards of 30° F. within an hour. A midday thunderstorm has the same effect, the clouds shutting out the sun, while the rain cools the surface of the earth and the surrounding atmosphere. The immediate sensation produced by the fall of temperature or the evening breeze is most refreshing; but it cannot be enjoyed with impunity until the thin day clothing has been changed. Wet clothes are particularly liable to cause a chill, and should be changed at the earliest opportunity.

The foregoing considerations indicate to some extent the points which should receive attention in selecting clothing for the tropics; and until the manufacturers succeed in producing a mixed fabric to fulfil all requirements, the wearer may mix his own fabrics in point of time, if not in material. He may wear cotton or linen in the daytime and the thicker woollen garment in the evening. The danger of chill at sundown, referred to above, suggests the absolute necessity for a change into dry and heavier clothing for the evening. It is not possible to lay down hard-and-fast rules on the subject of clothing, as what suits one man may possibly be irksome to another, and the following remarks, which embody the writer's personal opinions and practice, are offered merely as suggestions.

1. In hot weather very thin clothing of silk, linen, or cotton may be worn with safety and comfort, provided there is opportunity for changing into dry and heavier garments in the evening; otherwise, as *e.g.* when travelling, it is better to bear the discomfort of fairly heavy clothing during the day, in order to avoid the certain risk of chill at sundown.
2. In cool weather woollen wear is the safest.
3. It is important especially to guard the abdomen against cold, and abdominal belts may be worn for greater safety.
4. Remember that it is after hot days, when the clothes are damp from perspiration, that one takes a "chill." Beware of sitting down after exercise to "cool off."
5. Sleep with a light woollen vest under the pyjama jacket, to avoid chilling caused by a fall of temperature during the night.

All the foregoing refers to underclothing. For the outer garments, white or khaki drill is almost universally worn in the tropics, and is made up everywhere by the local native tailors at prices varying from 7*s.* to 20*s.* per suit. For quite cool weather ordinary light European clothes are suitable.

THE COLOUR OF CLOTHING

In order to avoid the detrimental effects of the actinic rays of the sun acting on the human body, it is advisable to wear some garment of a red or brown colour. Drills can be obtained woven of white drill outside, with a red inner surface. "Solano " is the name of a cloth now largely used in the tropics made on the same principle.

It is often more convenient to use actinic-proof underclothing. Ordinary white underclothing can be dyed by any fast red dye, or the garments may be made of red material. Red cambric, as manufactured for sale to natives, is perfectly suitable for this purpose, and very cheap. If economy is a consideration, few garments can be cheaper than a shirt of red cambric, put together by a native tailor, and it may be worn next the skin or over a thin vest.

Ladies are reminded that sunburn and freckles are produced only by the actinic rays, and may be prevented entirely by the use of red or brown veils, white or blue veils being practically useless for this purpose.

HEADGEAR

During the daytime in the tropics the use of a helmet is imperative. It must be light in weight, thick enough to protect the head from the heat of the sun, lined with red to stop the actinic rays, and well ventilated by an opening at the top, and at the base by the contrivances of corks or pith zigzags which lift the helmet away from the head band. The brim should be wide, projecting far and downwards at the back, to afford protection to the nape of the neck.

BOOTS

Two articles may be mentioned under this heading as being of special service in the tropics. First, the long, waterproof " gum-boot," used by persons whose occupations call them out in the early morning, and who have to walk amongst long grass. Tropical dews are very heavy, and trousers become soaking wet in a few minutes. The other, the "mosquito boot," is considered an essential in many parts of the tropics, and utterly unknown in other parts. This useful article is made of stout canvas, and reaches up to the knee. Trousers or pyjamas are tucked into the leg of the boot, and a tape tied below the knee keeps the boot in place. The mosquito boot carries a thin leather sole and heel, and is very light in weight ; it can be slipped on in a second, and is used for wear in the house, office, or compound, instead of slippers. When one remembers the fiendish delight which certain varieties of mosquitoes appear to take in biting ankles left unprotected by slippers, it is strange that the use of the mosquito boot has not become universal throughout the tropics. It affords protection also against ticks and "jigger-fleas," and in plague centres the danger of infection from the bites of rat fleas would be greatly diminished by the use of these boots.

Finally, on the subject of clothing may be mentioned the protection against the sun afforded to the spine by a "spine-pad" of several thicknesses of cloth sewn into the back of the coat ; and the comfortable support supplied to the calf during long walks by the use of puttees.

THE SUN UMBRELLA

Persons whose occupations compel them to be about during the midday hours, exposed to the heat and direct rays of the sun, may derive great protection from the use of a green or yellow sun umbrella. Apart from the danger of actual sunstroke, such exposure is often followed by minor indispositions, such as headaches, undue fatigue, sleeplessness, and mental and physical lassitude. The use of the umbrella will do much to obviate these effects of sun exposure. It is worthy of note how frequently well-to-do coloured persons use an umbrella when out of doors at midday.

THE WASHING OF CLOTHES

Except in the largest towns, where modern and sanitary steam laundries may exist, domestic washing should be done at home, and under personal supervision. When the resident in the tropics has once noted the filthy habits and persons of native washerwomen, the filthy puddles in which clothes are often washed, and the filthy hovels in which they are dried and ironed, he will only need to remember the danger of infection of certain skin diseases, and the risk of introducing bugs and lice into his house, to realise the desirability of keeping his clothes under his own observation as much as possible.

HOUSES, HUTS, AND TENTS

The building of permanent houses for the tropics falls outside the scope of this book, and advice should be sought from an experienced tropical engineer. Suffice it here to remark that rooms should be capable of excluding excessive light ; deep and low verandahs are desirable, or blinds which permit of shade with free ventilation, such as are made of split bamboo or reeds, or the more permanent blinds of wood on the open venetian principle. Punkahs are essential for comfort in hot, still weather. In most parts of tropical Africa people have not yet realised that they can do better work in their offices if seated under the refreshing breeze of a punkah. Not only does a punkah correct the exhaustion and discomfort of excessive perspiration, but it protects against the bites of mosquitoes. It would appear that a mosquito can sustain a gentle breeze which blows steadily in one direction, without being incommoded, whereas it finds the alternate to and fro breeze from a punkah disconcerting and abandons its attacks.

One is very struck, on entering some offices, to observe the clerks sweltering in the sultry atmosphere, with perspiration trickling from every pore, and spending a considerable part of their time in scratching their ankles, which are being bitten by the mosquitoes lurking under the dark tables, or in repelling the attacks which the bolder insects direct against the unfortunate men's faces. All this could be prevented by the use of punkahs and mosquito boots ; and some intelligent heads of firms have recognised the fact that they can get better service from their employees if they give some attention to the comfort of their staff by installing the punkah and recommending the use of the boots. By a compound system of pulley ropes, one native at about sixpence per day can keep going all the punkahs in a large office. To look for no better motive, a punkah is an investment which will return a profit.

If the circumstances of the business permit, offices should always be rendered mosquito-proof by wire gauze fitting, when the mosquito boots are of small importance. The mosquito-proofing of houses is dealt with elsewhere.

Huts, as temporary abodes, are often built in the tropics by people engaged in such occupations as prospecting or hunting. They are best placed in open situations, and under the shade of large trees. In localities where no large trees grow, the roof should be thickly covered with reeds or grass. A portable mosquito-proof door and window should be provided; failing these, a bed net is indispensable.

Tents should be provided with a separate fly piece, and the tent may be lined with actinic-proof red cloth. The "Boris" tent, with its floor made in one piece with the walls, its mosquito-proof door and window (with canvas door and window for cold nights), offers an ideal tent for short shooting trips. The whole outfit can be carried by one porter, and the tent can be erected in a few minutes.

REST

The old adage "Early to rest and early to rise," if followed in the tropics, will at least assist to "make a man healthy." The early hours are the most pleasant of the whole day; the air is usually cool and fresh, the heat of the sun not yet felt, and exercise can be taken without discomfort or fatigue.

The actual number of hours of sleep required by any individual may be taken as the same number of hours to which he has been accustomed in Europe, or possibly one hour more; for life in the tropics in general may be said to be more exhausting than life in temperate zones, and sleep during hot nights is apt to be disturbed, and may be therefore considered as having a somewhat lower restorative effect than the sounder sleep of cooler climates. The number of hours of rest required—as distinguished from actual sleep—must undoubtedly be placed higher in the tropics than in Europe, chiefly owing to the fact that the midday hours are utterly unsuited for active bodily or mental exertion of any kind, so far as most European residents are concerned. In the hotter parts of the tropics it will be noticed that the natives, notwithstanding their inherited immunity against the effects of the climate of the countries in which they were born, prefer to take a siesta during the heat of the day; and although this may not prove much, it is not necessarily merely a token of their natural indolence. Many native habits and customs are established on the experience of centuries, and are not to be lightly disregarded; for in such matters as foodstuffs, house-building, rest, clothing, etc., may be found many items which might be adopted in a modified form to the advantage of the European. One such item is the midday siesta, and if circumstances permit, the hours between twelve and two should be given to rest, or to the lightest recreation. The usual hour for late breakfast in the tropics is between eleven and twelve, and, if possible, it is wise to remain in cool and shady rooms between eleven and three. Whether actual sleep is beneficial or harmful during the heat of the day is a question much debated by tropical residents. The writer believes that ladies and children, delicate persons, and men who are strictly temperate in their eating and drinking often derive much benefit from the midday siesta, and that no objection can be raised against the habit. But the case is different with the hearty, robust man of full habit. The man who "likes to do himself well," who takes a heavy midday meal, with a bottle of wine, followed by a liqueur and a cigar, and who goes straight from the table to his bed for a couple of hours' heavy sleep, is not giving himself a fair chance. Such midday habits have much to do with the production of the sluggish "tropical liver," and the hearty man of thirty is seen fifteen years later as an irascible semi-invalid.

EXERCISE

A reasonable amount of regular exercise is one of the measures which a wise resident in the tropics will adopt as being necessary to the preservation of fitness and health. What form the exercise shall take is entirely a matter of personal preference ; but whatever form be selected, it should be such as will afford not only muscular activity, but also mental diversion. This is where such mechanical exercises as dumb-bells, Indian clubs, and rubber-stretching machines so often fail. If a person enjoys such exercises, and undertakes them with zest, if his main ambition is to add another inch to the circumference of his biceps, or to lift heavier weights than his fellows, these exercises may be of real value ; particularly if they can be performed, not alone, but in the company of friends similarly occupied. But to undertake such exercises merely from a sense of duty, and to perform them for a certain number of minutes, with a feeling of utter boredom, is absurd. When an exercise fails to interest it is useless. Exercises should carry with them mental relaxation, interest, or excitement, and should be such as can be entered on with pleasurable anticipation. All athletic games, swimming, rowing, promenading, riding, or walking in pursuit of game, are in the opinion of the writer infinitely preferable to any mechanical systems.

The best time of the day for exercise is the early morning after a light breakfast, or late in the afternoon ; the extreme heat of midday should be avoided. Exercises should never be carried on to the point of exhaustion, and when completed, a sponge down and a change of clothes are to be recommended.

THE AVOIDANCE OF MOSQUITO BITES

Chiefly through the labours of Sir Ronald Ross the avoidance of mosquito bites has now become generally recognised as the most urgent necessity for the preservation of health in the tropics. Malaria, elephantiasis, and yellow fever are spread solely by the bites of different species of these insects.

The following measures may be adopted with the object of avoiding the bites of mosquitoes. (Reduced from " Prevention of Malaria." Ross.)

I. THE USE OF A BED NET

The mesh of the muslin should be not less than twelve to the inch ; the net should be made in one piece without any opening at the side, the sleeper entering by creeping under the bottom of the net ; it should hang inside the supports or bed posts so as to tuck under the mattress all round ; it must be free from holes, or mosquitoes will certainly find them and enter ; the net should be made to fit the bed, and should be stretched tight in all directions, so as not to prevent the free entrance of currents of air. Portable mosquito-proof beds or mosquito-proof tents are obtainable for travelling.

If possible a large net and a large bed should be used to avoid the hands, knees, and feet coming in contact with the sides of the net during sleep and being bitten by insects outside the net. Failing a large bed, a valance of muslin may be sewn round the base of the net about nine inches above the upper level of the mattress, and tucked loosely under the mattress with the net.

2. FIXED MOSQUITO-PROOF ROOMS

These are made by erecting in any bedroom or verandah a light wooden framework carrying gauze wire. They are made large enough to hold the bed and table and chair, and are provided with a self-closing door. They may be permanent fixtures, or so constructed that they bolt together only in sections, when the whole structure can be rapidly taken down and re-erected elsewhere when required.

3. MOSQUITO-PROOFING OF DOORS AND WINDOWS

This method has many advantages over the use of the bed net, and permanent bedrooms should be so protected. It excludes flies and other insects as well as mosquitoes ; it breaks the glare of the sun during the day, and does not interfere with free ventilation. Doors must be provided with springs, and should open outwards.

4. MOSQUITO-PROOFING OF VERANDAHS

This adds largely to the cost of protecting houses, but it practically doubles the area of house-room, and the residents in houses with mosquito-proof verandahs usually live most of the time on the verandah. It is by far the best method of mosquito-proofing, and at least a part of the verandahs should be so protected. Apart from all questions of health, comfort alone justifies the expense. In the tropics one is exposed to ceaseless annoyance, and occasionally danger, from the visits of snakes, scorpions, tarantulas, centipedes, frogs, lizards, bats, biting and stinging insects, flying ants, and countless other winged creatures, until life becomes almost unbearable. The mosquito-proof verandah excludes all these annoying creatures, and is even strong enough to protect one's dogs from the attack of a prowling leopard. The writer looks upon a mosquito-proof verandah as an absolute necessity for comfort and health in the tropics.

5. FANS AND PUNKAHS

These are useful for driving away mosquitoes when sitting in unprotected rooms, and also serve to keep the body cool. The question of punkahs is also alluded to under the subject of houses.

6. TO REDUCE THE NUMBER OF MOSQUITOES NEAR A HOUSE

Mosquitoes breed only in water, where the larvæ appear as the familiar "wrigglers." Different species prefer various situations, but a collection of water of any kind, and no matter how small, may serve the insects as a breeding-place. Thus Anopheline mosquitoes, which carry malarial fever, prefer pools or puddles, swamps, or sluggish streams, and especially such as contain weeds and are shaded by reeds or grass. They are sometimes called "wild" mosquitoes. Culex mosquitoes, which carry elephantiasis, and Stegomyia mosquitoes, which carry yellow fever, are sometimes called "tame" mosquitoes, as they prefer to breed in tubs or other utensils near houses. Under all circumstances, however, the larvæ can easily be attacked, and the numbers of mosquitoes in any locality greatly reduced.

Pools and puddles should be drained or filled in, and the edges of streams should be trimmed, as the larvæ chiefly lurk among the weeds at the edges. Paraffin should be poured once a week over pools that are too large to drain if any larvæ are found therein. Dense vegetation should be cleared away for four hundred yards around houses, in order to deprive adult mosquitoes of their favourite cover. The site for a house should be selected at least eight hundred yards from any pools, swamps, or streams. In the house, garden, or compound, no stagnant water must be allowed to serve as breeding-places. Mosquitoes will breed readily in water barrels, tubs, cisterns, drains, guttering, buckets, baths, tins, broken bottles, flower pots, tins placed under table legs to avoid ants, jugs of water in spare bedrooms ; in fact, in any and every article that can hold exposed water. All rubbish must be carried away and buried, and all receptacles for necessary domestic supplies should be closely covered or screened with gauze wire. The introduction of small fish into ornamental water, *e.g.* fountains, pools, or garden cisterns, will be useful. Guttering must be kept in order, or a small hole may be pierced in any place that sags. The whole subject may be summed up in the axiom of Ross, "No stagnant water," and if the householder follows this rule, he will reduce the mosquitoes round or in his premises to a minimum.

HOUSEHOLD SANITATION

The ample space usually allowed for compounds, the disinfecting effects of bright sunlight, and free ventilation do much to simplify sanitation in the tropics, and to prevent the spread of infectious diseases among Europeans. In settlements the sanitary service is usually undertaken by the local authorities, but for isolated houses the following brief notes may be of service.

CLOSETS

The most convenient system is the pail closet. Dry earth or ashes should be used freely to cover the contents, a box of earth or ashes being placed in the closet and a small spade kept in the box. The pail should be removed each day, the contents thrown into a hole situated at a distance from the house, and a spadeful of earth thrown into the hole after emptying the pail therein. The pail may be tarred, or washed and disinfected. It is convenient to keep two pails in use, each being used on alternate days.

The earth privy—a building erected over a large hole in the ground—is frequently seen, but the pail system is to be preferred.

SOLID REFUSE FROM KITCHENS

A kitchen bucket should be provided, and contents disposed of as above.

HOUSEHOLD SLOPS, LIQUID REFUSE, FROM SCULLERIES, ETC.

The habits of native servants in disposing of liquid refuse of the above nature, by throwing it broadcast upon the ground a few yards away from the house, should be checked. A barrel may be provided with two rope or wire handles, which, slung on a pole, may be carried by two servants to a reasonable distance and emptied once or twice a day. At least the householder should insist on each bucket of slops being carried far away from the house.

BATH WATER

May safely be used for watering the garden.

PANTRIES

Pantries should be protected by gauze windows and doors, to prevent the entrance of flies, which often contaminate food by mechanically conveying germs on their feet or proboscis. Failing this, gauze covers may be used for the separate dishes.

STABLE REFUSE

Owing to the fact that flies breed largely in stable refuse, it becomes important that stables be kept clean; and manure should not be allowed to be collected into large heaps near any dwelling. If it cannot be disposed of by digging it into a garden, it should be removed to a considerable distance, and preferably buried. Accumulations of manure near a house will inevitably be the cause of swarms of flies within the dwelling; and apart from the discomfort and annoyance caused by these insects, their visits represent increased risk of infection by epidemic diseases. During the South African war, in many camps, and in spite of every precaution to secure a supply of pure drinking water, it was found impossible to prevent the occurrence of constant cases of typhoid fever. The failure to do so was largely attributed to the swarms of flies with which the camps were often infested.

THE CAUSE OF DISEASE

It is the misfortune of man, in common with all other animals, to be subject to the attacks of parasites; which may be large and visible to the eye, as *e.g.* the tape worm, or they may be very small and visible only by the aid of a powerful microscope. Such microscopic parasites are classed together under the name of "germs." According to certain characteristics (chiefly the mode of reproduction), "germs" may be divided into vegetable and animal organisms, and each species of germ has a more or less well-defined habit of life. Many of them have become parasites of man. Some such parasites do little harm; others always produce disease; and it has now been shown that nearly every disease of man is caused by the presence in his body of some particular parasite or "germ."

The simplest germs are the "bacteria" or microbes. They are minute plants, which may be rod-shaped, when they are called "bacilli," or spherical, when they are called "micrococci." Their life history is very simple, for they live about twenty minutes, under favourable circumstances, and then multiply by dividing into two; thus one germ is capable of producing an immense number of descendants within twenty-four hours. They are able to live for long periods outside the body of man, in the air, in water, or lying on the soil; and when they are introduced into man—either by being swallowed with food or water, breathed into the lungs, or inoculated into wounds, or into the blood by the bites of insects, or by any other method—some of them cause diseases. The presence of these tiny organisms in man's body would not really be of much consequence, but as they grow and multiply they manufacture certain poisonous products called "toxins," and the effect of these toxins or poisons is the real cause of the disease.

The extent to which different microbes invade the body varies largely. Many invade the blood and thereby the whole body, as for example the bacillus of bubonic plague; in lockjaw or tetanus, the bacillus having been introduced into a wound grows and multiplies in that wound, but never invades the rest of the body, but its powerful toxins are absorbed into the blood and commonly prove fatal. In Asiatic cholera the germ never gets beyond the wall of the intestine, but again its toxins are absorbed. Some microbes, indeed, never enter the body at all, and can yet cause illness; thus in ptomaine poisoning, bacteria of putrefaction were growing in the food before it was cooked, and, although destroyed themselves by cooking, their products (toxins) remained to poison the consumer. The yeast of alcoholic fermentation is a germ; and its product, alcohol, if taken in large doses will be proved to be a toxin.

Not all germs are parasitic in their habits, neither are they all harmful to man; on the contrary, some are beneficial, among which may be mentioned baker's yeast, the microbes which live in the soil, and produce the nitrates essential for the growth of crops, and the bacillus of "sour milk," which has recently been brought so prominently before the public.

The animal parasites have a more complicated life history, and usually spend part of their life cycle in man, and part in some other animal or insect. It is well known that the common tape worm infects man through eating pork from a pig infected with "measles"; the tape worm has two alternate hosts, man and pig. Exactly by the same method of alternate hosts do the microscopic animal germs maintain their existence, the second host being most commonly a blood-sucking insect. One of the main differences between the diseases of the tropics and diseases of temperate zones is the large number of tropical diseases which are due to animal parasites and which are carried by insects.

THE PART PLAYED BY INSECTS IN THE TRANSMISSION OF DISEASE

In the case of diseases due to the vegetable parasites, Nature has made no direct provision for the introduction of these germs into man's body; but of accidental methods there are plenty. Water, food, air, dust, all serve at times to carry these germs into the human body. But insects also often mechanically carry germs on their bodies; and the worst offender of all is the common house fly.

"Every one must have observed that the fly is a filth-eater. What dust-bin, what garbage exists without the fly? We become aware that something is wrong or rotten, by the presence of flies. We must have all experienced the dread with which we have seen the common fly in the sick-room. Wherever there is rotting, fermentation, or decay, or, in other words, animal or vegetable offal, or excreta of any kind, there the fly must be. Why? Because as the water barrel is to the larva of the stegomyia, and the earth-pool to the larvæ of the anophelines" (*i.e.* mosquitoes), "so is putrid, fermenting material to the larvæ or maggots of the fly. The fly breeds there, deposits its eggs there, and they hatch out into the well-known maggots. It is not surprising, then, that the natural breeding-ground being filthy material, the fly should carry on its body some of this filth to the sugar basin, the entrée dish, or the milk in the bowl in the pantry. Unquestionably the fly can and does contaminate our food supplies, and by landing on the face around the eyes and mouth it may directly inoculate disease germs. The presence of flies in a house means that filth is close at hand, not miles away, but, in all probability, close outside the kitchen window in the dust bin, or in the adjacent stables, or in the highly manured garden soil around the house.

"The fly has now been proved experimentally to be a carrier of cholera, typhoid, tubercle, and no doubt the germs of summer diarrhœa. In Egypt the dissemination of the common ophthalmia present among the poor people is also largely due to the fly; for we have no doubt seen in that country the eyes of children rendered black by swarms of them" (Sir Rubert Boyce).

The risk of disease being carried by flies has already been alluded to under the heading "Stable Refuse." The remedy, as there pointed out, is strict cleanliness of domestic sanitation. Another insect closely associated with disease is the rat flea. This is now known to be the chief means by which bubonic plague is carried to man, but the method here is also mechanical and accidental.

But turning to the diseases due to the animal parasites or germs, we find that Nature has trusted here to no accidental casual method of transmission, but has devised an exact, definite plan by which the existence of the tiny parasites is ensured. Malaria, elephantiasis, sleeping sickness, yellow fever, and relapsing fever are caused by germs which, so far as is known, never exist free in water or air, or lying on the ground, but they live in the blood of man during the attacks of illness, whence they are abstracted by blood-sucking insects, which after an interval are capable of inoculating the disease into other persons. The important point to realise is that the parasite to carry on its existence must pass from one host to the other, otherwise the parasites would entirely die out with the death or cure of the sick; and further, in the insect an essential part of the life cycle of the parasite takes place. Alternation of hosts has become necessary for the continued existence of these tiny creatures. In the case of the malarial parasites every step has been worked out; and although the evidence is not yet complete for some of the other diseases mentioned, there is little doubt that it will be forthcoming before long. It is at least certain that malaria is carried only by anopheline mosquitoes, elephantiasis by culex mosquitoes, sleeping sickness chiefly (possibly only) by tse-tse flies, yellow fever only by the stegomyia mosquito, and relapsing fever in the tropics by ticks.

In the tropics, therefore, the prevention of illness becomes to a great extent the avoidance of the bites of insects. How to succeed in this object as far as possible is dealt with under the separate diseases.

PUBLIC

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PART II

DISEASES AND ACCIDENTS

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ABSCESS

A SUPERFICIAL abscess may be recognised by four characteristics—pain, heat, swelling, and redness of the overlying skin—and the sooner it is opened the better; but a knife cannot be thrust with impunity into any part of the body, or important structures, such as blood-vessels or nerves, may be cut with serious results. This is especially true of the neck, armpit, and groin. Never make a deep cut in such a part, but wait until the abscess "points," when a knife may be thrust *through* the swelling, but not *into* it, with safety.

Not every superficial swelling is an abscess. Natives suffering from scurvy often have painful swellings under the skin, but these are not specially hot, and the absence or presence of redness is not easily noted on a black skin. Such scurvy swellings often end as abscesses, but at first they contain blood only, and if opened in mistake for an abscess a serious hæmorrhage might result.

Two common abscesses usually due to puncture by a dirty instrument, such as a frayed wire rope or a fish-hook, are:

THE FINGER ABSCESS OR WHITLOW

This is a painful condition, and if neglected may lead to the loss of the finger. Open it at once, and here the incision may be deep, but there is one caution. On the front of the finger a deep incision must not be in the middle line, or the tendon (" leader ") may be injured, and the infection may spread along its sheath. Make the incision well to one or other side of the middle line. On the back of the finger, when the whitlow runs round the nail, the incision may go down to the bone if necessary to tap the pus.

THE ABSCESS OF THE PALM OF THE HAND

The treatment of this condition should only be attempted when it is quite impossible to reach a doctor. In such a case the abscess should be opened as soon as it points, but under no circumstances must an incision be made in the middle of the palm, or important blood-vessels are likely to be cut, with serious and dangerous results. The only part of the palm which can be cut into with safety is the last half-inch nearest to the fingers, and there only in a continuation of the middle line of the fingers, as opposite the clefts run the blood-vessels.

A palmar abscess often penetrates through to the back of the hand, and here it may be dealt with more safely, opening it wherever it points.

AFTER-TREATMENT OF ANY ABSCESS

The opening caused by an abscess, whether due to bursting or to incision, should be kept open for drainage, until the abscess has healed from below upwards. This object can be secured by pushing a small strip of dressing into the wound, and replacing it each day by a clean piece. The wound may be washed every day, with a mild antiseptic such as weak Condy's fluid, and a light dressing should be applied to exclude the air. If no dressings or drugs are available, water boiled and allowed to become cool enough to use will do, and strips of old linen, boiled in water for some minutes to render them aseptic and dried, may be used as dressings.

Rest is necessary for rapid healing ; a cardboard splint for a finger, or a sling for a hand.

ACUTE ALCOHOLISM

(*Delirium tremens, commonly known as* " *The Rats* ")

This condition is occasionally met with even in the bush, in the case of a person who has been drinking excessively, and is usually regarded by others with either disgust or amusement. It should not be forgotten that the condition is an illness which may be fatal—a poisoning by the drug alcohol—and that the sufferer is entitled to consideration.

The treatment is to keep the patient quiet and induce sleep. He should be kept in bed in a darkened room, with some one in constant attendance. Force is seldom necessary, as such patients are usually amenable to reason. The food should be milk, soup, or beaten eggs at short intervals. Occasional hot baths or tepid sponging have a soothing effect, and bromide of potash in twenty-grain doses may be given twice a day. Alcohol must be cut off entirely, but if the patient has not slept for several days, and is getting very weak, a tablespoonful of brandy disguised in egg flip may be required as a stimulant every four hours. A good sleep is usually followed by prompt recovery.

ANTHRAX

The " malignant pustule " of man, usually situated on the hand, is acquired by accidental inoculation from sick cattle, or other domestic animals. The part becomes very inflamed and swollen, and finally appears to be a central black scab, surrounded by small blisters or pustules.

The whole affected part should be cut out, and a wet dressing 1 in 20 carbolic acid applied. If a hypodermic syringe is available, a few drops of 1 in 20 carbolic should be injected at several spots around the edge of the wound.

BLACK-WATER FEVER

A disease occurring in the malarious districts of Africa, characterised by abrupt onset, fever, vomiting, pain in the back, discoloration of the skin and whites of the eyes to a brownish yellow (the so-called "jaundice"), and the passage of urine which is at first usually bright blood red in colour, and clear, but quickly becomes scanty, thick, and dark red to brown, or almost black in colour. The disease is highly dangerous, but the majority of the cases may be saved by careful nursing alone. A consideration of the causes of death in blackwater fever immediately suggests the correct lines of treatment. In practically every fatal case death occurs owing to one or other of two causes—suppression of urine or heart failure.

SUPPRESSION OF URINE

The material coming away in the urine has the power of spontaneously clotting, like the white of a boiled egg; and if it is allowed to clot in the structure of the kidneys, these organs become completely blocked, and suppression of urine and death will ensue. This accident must be guarded against by keeping up a constant flush of urine to wash the material out of the kidneys, by constantly giving the patient water, minerals, or weak tea to drink. Two to four ounces of fluids may be given every quarter of an hour at first, and later hourly doses of upwards of half a pint will suffice. If the patient is perspiring freely the amount may be increased, for the kidneys will not be flushed if all the fluid is being excreted through the skin. And if vomiting occurs the fluid must be introduced into the bowel as an enema, half a pint every hour. Should the patient be unable to retain so large an enema, smaller quantities must be given more frequently, a teaspoonful of salt being added to each half-pint of water.

HEART FAILURE

The material coming away in the urine is equivalent to a serious loss of blood. The patient is in the position of having a severe fever, and being extremely bled at the same time. Small wonder his heart flags. He must be kept lying down in bed, all movement or sitting up forbidden, and a bed pan procured or improvised.

Drugs are not essential for the successful treatment of black-water, but the Extractum Cassiæ Beareanæ often appears to exert a great influence in arresting the disease. A teaspoonful may be given with a little water every two hours until the urine clears. Alcohol, as tablespoonful doses of brandy or whisky every three or four hours, should be given if the patient appears very weak, and champagne is often useful. Quinine should be withheld entirely. The food should be milk or soup.

The cause of black-water is still under dispute, but at least it is certain that long-standing, uncured malaria and indiscreet doses of quinine are both factors which may contribute to bring about an attack of black-water. People who live in localities where black-water occurs should endeavour to thoroughly cure each attack of malaria by continuing quinine treatment in small doses for at least two months after apparent recovery. And persons who have been suffering from constant attacks of malaria, and who possibly have taken no quinine for some time, should be particularly careful not to suddenly commence taking quinine in large doses. Five-grain doses of quinine three times a day will control malaria, and will not cause black-water. A single dose of fifteen grains or more is dangerous. This indiscreet dosage of quinine has caused about two-thirds of all the cases of black-water which have come within the experience of the writer. Persons who have recovered from an attack of black-water should, if possible, remove to a healthy district, as one attack predisposes to another.

BLISTERS

Trivial as this injury is, it is yet sufficient to often prevent the sufferer from walking, and "a foot soldier is no better than his feet."

Blisters can usually be avoided by the use of well-fitting boots and fairly thick socks. Boots which are too large are certain to cause blisters on a long march. It is a useful precaution to soap the heels of the socks.

When a blister has formed but not broken, it should be opened to drain away the contents. This can be sometimes done by tunnelling with a needle under the surface of adjoining healthy skin, and squeezing the fluid through the little tunnel. The blister, being thus emptied without the admission of air, collapses, and heals at once. When a blister is open it is best to cut the skin away, and treat it as an open wound, by applying a dressing with the aid of adhesive plaster.

An attempt may be made to harden the skin of very tender feet by rubbing spirit over them twice a day. They should receive careful attention at the end of a march, being washed and dried ; dusting powder may prove useful.

BOILS

Poultices, hot fomentations, and incisions are more likely to do harm than good. Boils are best dusted with boric acid powder, and protected from pressure with a thick gauze dressing. The area may be washed once a day with 1 in 20 carbolic lotion. When the boil comes to a head the tip may be sliced off and a tiny drop of pure carbolic acid applied. The discharge from a boil is very infective, and if allowed to soil surrounding areas of skin, or carried by the fingers to other parts of the body, a new crop of boils will probably result.

BURNS AND SCALDS

Cut away the clothes ; do not try to remove them. Open blisters, so that the fluid may escape, and with all speed cover the injury with an oily dressing—vaseline spread on lint, or lint soaked in olive oil. The dressings must be changed as soon as they become foul, or sodden with discharges. Later the injury may be treated as an ordinary open septic wound, by washing with boric acid lotion, dusting with iodoform, and covering with a dry gauze dressing.

COLIC

Acute gripping pain in the abdomen, due to violent efforts of the intestines to empty themselves of irritating masses of undigested food, or accumulation of gas. The trouble is often preceded by constipation, and usually cures itself with an attack of diarrhœa.

The patient should be in bed, and hot fomentations applied to the abdomen. An enema of warm soapy water may be given ; purgatives should not be given at first, but rather a dose of laudanum (fifteen drops) to check the movements of the intestines. If the pain is situated low down in the right side (and especially if constipation and vomiting are present), what appears to be colic may really be an attack of appendicitis, and the use of a purgative in such a case would do harm. It is safer therefore in all such cases of pain in the lower part of the abdomen to continue treatment as above —fomentations and occasional small doses of opium—until the acute symptoms subside and the bowels begin to act ; when, if any feeling of discomfort remains, a dose of castor oil may be given to assist the process.

CONJUNCTIVITIS

(*Inflammation of the membrane covering the eye*)

This is usually brought about by too much exposure to the glare of the sun or wind, or to the irritation caused by dust, sand, etc., getting into the eye. The eye is " blood-shot," hot, and painful, and waters profusely. Patients complain of a feeling of having grit in the eye. The severer forms of conjunctivitis (ophthalmia) are very contagious, and the disease is much spread, among children, by flies, which carry the germs of the disease on their legs from the sick to the healthy. Persons with inflamed eyes should use separate sponges, towels, etc.

The milder forms of conjunctivitis are easily curable as a rule by using an eye-wash of boric acid lotion ; occasionally an astringent lotion is necessary, as zinc sulphate, one to two grains in an ounce of water. Of this one or two drops only are dropped into the inflamed eye.

The more severe forms of ophthalmia with a discharge of pus from the eye require skilled treatment. Until such can be obtained, the eye may be douched copiously and frequently with a 1 in 10,000 solution of corrosive sublimate, and the lids kept smeared with vaseline to prevent them sticking together and retaining the discharge.

Many people suffer frequently from recurring attacks of slight conjunctivitis due to the glare from sand, white houses, etc., and the general intense light of the tropics. They have " weak eyes." The constant use of smoked glasses during the day, or, at least, when out-of-doors, will do much to relieve their trouble.

CONSTIPATION, AND THE USE OF PURGATIVES

To maintain a regular daily action of the bowels is of rather more importance in the tropics than in temperate climates, owing to the frequent association of constipation with derangements of the liver ; the condition spoken of as " tropical liver " is brought about to some extent by constipation.

A condition of habitual constipation should be regulated so far as possible by natural means, and not by the constant use of drugs. Exercise, especially walking, is of service in correcting constipation, and a regularity of habit should be established. The use of certain articles of food will do much to stimulate the bowels to a regular action. These are brown bread, porridge, green vegetables, and fruit. In the great majority of cases, a diet which included plenty of brown bread or porridge, with salads and fruit, will entirely correct constipation and make the further use of drugs unnecessary.

When drugs are required, the choice may be made from a great variety. Calomel is useful as an occasional purge to clear the liver, and at the commencement of illnesses, but it is quite unsuited for frequent use. The writer has seen several cases of severe mercurial poisoning due to the too constant use of calomel, either taken alone or as the Army No. 9 pill. The best purgatives for habitual use are the salines—Glauber's salt (sulphate of soda), Epsom salts (sulphate of magnesia), or Seidlitz powders. Cascara sagrada in capsules or pills is a mild but efficient remedy, and suitable for frequent use. Of the more powerful vegetable purgatives, suitable for occasional use in chronic constipation, or to empty the bowels and liver freely and promptly in biliousness, due, for example, to too free living, the old-fashioned compound pill of colocynth with hyoscyamus is reliable, and rarely causes any gripping or discomfort.

COUGHS AND COLDS

(*Catarrh*)

It might be expected that these ailments would be absent from warm climates, but, on the contrary, they are common and often severe. The usual domestic remedies will be found efficacious—bed, a hot bath or mustard foot bath, hot drinks and plenty of bedclothes to induce perspiration, with a ten-grain dose of Dover's powder, will often suceed in cutting the attack short. Quinine is of value in the treatment of feverish colds; the ammoniated tincture is a popular remedy in Europe, but in the tropics the powder or tabloids will more usually be available, and they are of equal value (five to ten-grain doses).

The following local treatment may be adopted. For nasal catarrh (cold in the head), the interior of the nostrils may be smeared with boric ointment, or carbolic oil (one part of liquid carbolic acid to thirty parts of olive oil); for sore throat gargles of weak solutions of permanganate of potash, and tabloids of chlorate of potash allowed to dissolve in the mouth; for cold on the chest, the inhalation of steam from a jug of boiling water, and the local application of a poultice or a mustard leaf.

DIARRHŒA

An occasional diarrhœa is nature's method of relieving overloaded or fatigued digestive organs, and is beneficial at first. It usually ceases when the intestines are completely emptied, and requires no treatment. Should it continue for more than twelve hours, the process may be assisted by a dose of castor oil or salts, after which a few drops of chlorodyne may be taken if any discomfort still continues, but this will not usually be necessary.

PUBLIC

If diarrhœa occurs frequently, the commonest causes are overfeeding, a diet which contains too much meat and too few vegetables, the excessive use of tinned food, or the abuse of alcohol. A reduction of the amount of alcohol consumed, and a plain, spare diet, consisting chiefly of vegetables, will be followed by immediate improvement.

DISLOCATIONS

These injuries require skilled treatment, but if such is not available an effort should be made to reduce the dislocation in the following cases.

DISLOCATION AT THE SHOULDER

The deformity is usually plainly visible; the shoulder appears flattened, while the elbow projects outwards; the arm is rigid (differing from a fracture); and the head of the bone may be felt to be lying in an abnormal position. Sitting by the side of the patient, who is lying down, and on the same side as the injury, place the unbooted foot *of the same side as the patient's injury* in his armpit, and holding his wrist firmly with both hands keep up a steady downwards pull, while the instep of the foot in the armpit levers the bone outwards. If the manipulation is successful, the bone will snap back into its place after a few moments. The arm must then be bandaged to the side, and carried in a sling for three or four weeks.

BACKWARD DISLOCATION OF THE ELBOW

The patient sitting on a chair box, the operator rests his foot on the chair, and places his knee in the bend of the injured elbow. Pulling on the wrist with one hand, while the other steadies the patient's arm above the elbow, the operator uses his knee as a lever to free the locking of the bones and allow them to be pulled forward into place.

DISLOCATION OF THE JAW

This injury occasionally happens from too widely opening the mouth—as in yawning—the two ends of the bone slipping forward out of their sockets. The injury is very easily reduced. Wrapping both thumbs well in a towel, to prevent them being badly bitten, pressure is made on the lower back teeth with the thumbs, while the fingers tilt the point of the jaw upwards. Or the patient may himself place corks between the back teeth on both sides, and press the point of the jaw upwards.

DISLOCATION OF THE THUMB

This takes place backwards at the joint where the thumb springs from the palm of the hand. It may be reduced in the following manner: One person holds firmly the wrist and the bone of the thumb, which lies in the palm. Another person grasps the thumb firmly in his hand, bends it forcibly backwards to a right angle with the bone in the palm, and, maintaining the right-angular position, pulls the two last joints forcibly forward until the bones are clear, when he suddenly bends the thumb back into the palm of the hand. It is well to practice these manœuvres first (gently) on an uninjured thumb to understand exactly their object; remembering that the second bone is displaced backwards and upwards upon the first bone (or to speak with anatomical exactness, the first phalanx is displaced on the metacarpal bone).

Dislocations of fingers and toes can usually be pulled back into place without much trouble.

After reduction of any dislocation the joint must be supported for two or three weeks by a bandage.

DROWNING

THE TREATMENT OF THE APPARENTLY DROWNED

1. Clear out all mud, water, froth, mucus, weeds, or other foreign matter from the mouth and nostrils at once.
2. Strip the body naked to the waist, and rub vigorously with dry cloths.
3. Wrap in warm blankets if available.
4. Artificial respiration.

The well-known method of artificial respiration while the patient lies flat on his back (Silvester's), is not the most suitable for treating a case of apparent drowning, as it is necessary in a case of this accident to place the patient in a position in which the water will drain away from his lungs. He should be placed lying face downwards, with a large bundle of clothes under his stomach (to ensure that his mouth lies lower than his chest) and a firm pressure now applied to the middle of the back. His mouth should be opened and his tongue pulled forward. One arm is now carried above the head and slowly pulled on until the body is turned half over, and comes to lie on its side ; the arm is then carried back to the side and the body turned back to its original position, face downwards, and the back again pressed on. These series of movements are to be carried out deliberately and slowly, and without any jerking or violence ; each series should occupy three or four seconds, and in the absence of any sign of life they should be repeated for at least an hour before the patient is assumed to be dead ; for several hours it may still be possible to restore a patient.

As soon as the patient begins to breathe naturally, the rubbing and warm blankets are of great service in stimulating and sustaining him, and so soon as he can swallow he may be given a little hot spirits and water.

DYSENTERY

Blood passed by the bowel may be caused by many conditions, the commonest of which is bleeding hæmorrhoids ; but true dysentery is an acute illness of sudden onset, and is characterised by fever, pain, straining and griping, and the constant passage of small quantities of blood and mucus.

Treatment.—Rest in bed, warmth, and a diet of milk and water, and arrowroot (beef-tea and soups are injurious). An ounce of castor oil should be given at once, with fifteen drops of laudanum ; and, African dysentery being frequently mild in type, these measures often secure a prompt recovery.

A similar line of treatment is to keep up a free watery purgation by giving teaspoonful doses of sulphate of soda or sulphate of magnesia in small quantities of water until all pain and griping has disappeared. The above dose may be given every two hours at first, and as the condition improves less frequently. Should dysentery assume a chronic form, every effort should be made to get the patient quickly under skilled medical treatment. Dysentery is a water-borne disease, and all drinking water should be boiled in localities where the disease is known to occur.

For the very severe types of dysentery as described chiefly from India, the ipecacuanha treatment is still the favourite method. The patient fasting, fifteen drops of laudanum are given to prevent vomiting, and some twenty minutes later thirty grains of ipecacuanha. The patient must be kept absolutely quiet, and told not to swallow his saliva, or otherwise vomiting is almost certain to occur. No food or drink should be taken for six hours afterwards. One daily dose of ipecacuanha is given with the above precautions for a week, the size of the dose being gradually reduced to nil.

FRACTURES

Diagnosis.—When a bone is broken, the condition is usually readily recognised both by the patient and his friends ; but occasionally a fracture may be met with that is extremely difficult to diagnose, especially if in the neighbourhood of a joint. The following are the points which may help to determine the nature of the injury. A broken bone produces pain, swelling, and loss of power, deformity, unnatural mobility, and the fragments can usually be heard to grate together. On gently running along the length of a broken bone with the tips of the fingers, a gap or irregularity can be felt in most cases. It is not necessary to determine all the points to feel certain that a bone is broken, and occasionally some may be absent, as when one broken end is driven into the other and firmly fixed—mobility and grating are both lost in such a case. First take a good look at the injured part—the deformity may be easily visible ; then examine it very gently and carefully with the fingers, and a decision can usually be arrived at. In the case of an injury near a joint, when there is much swelling, it may be impossible to determine whether the bone is broken or dislocated ; and, indeed, both injuries may be present, the bone being broken below the joint, and the end also dislocated from its socket. When in doubt, treat the injury as for a fracture.

Treatment of Fractures in General.—If there is any displacement of the broken ends of the bone, they must be gently manipulated into a correct position, and then supported by bandaging on to the limb some kind of splint. Splints should not be applied too tightly ; their object is not to keep the broken ends of the bone absolutely immovable in position, but to prevent pain by restraining undue movement, and to prevent the injured limb falling badly out of its correct line. If they are too tight, the circulation is impeded and recovery delayed ; while slight mobility at the site of the fracture is of little consequence.

Splints can be made from board, strong cardboard, dry ox-hide, or stout reeds or strips of bamboo tied together with string, in the manner in which native blinds are made. A walking-stick or a ramrod may serve as a temporary support.

SPECIAL FRACTURES

FRACTURE OF THE COLLAR BONE

This is usually due to a fall on the hand or shoulder. The simplest treatment is for the patient to lie on his back on a firm bed with a small pillow or roll of towels placed lengthways between his shoulders, and a closely fitting shirt worn outside the arm of the injured side. At the end of eight or ten days he may sling the arm in a broad bandage, which gives good support to the elbow, and lifts it forward, and is fastened over the opposite shoulder ; and so get about with little discomfort or risk of displacement. If the patient insists on getting about at once, a pad may be placed in the armpit, and secured by a tape over the opposite shoulder ; the arm slung as above, and secured to the side by a bandage or closely fitting shirt.

FRACTURE OF THE SHOULDER BLADE

Is usually due to a severe direct blow. The injured parts should be steadied by strips of plaster, or a bandage round the chest, and the arm carried in a broad sling to support the elbow.

FRACTURES OF THE UPPER END OF THE ARM BONE, OR HUMERUS

These are difficult to diagnose, and often unsatisfactory in the results of treatment. If the injury is made out to be a fracture, and not a dislocation of the shoulder joint, the most promising treatment is to keep the patient on his back, with his arm in the "hand-on-hip" position. A small triangle, resembling in shape the pyramid triangle of the billiard table, may be made and well padded. It is then bandaged to the body and limb; one padded point of the triangle resting in the armpit, and one in the bend of the elbow.

FRACTURE OF THE SHAFT OF THE HUMERUS (THE UPPER ARM)

This may be treated by four rather narrow, well-padded splints, one in front, one behind, and one at each side; or strips of bamboo, tied together blind-fashion, may be arranged to encircle the arm. The splint must not be long enough to chafe the armpit or elbow; and it must not be applied too tightly, or the circulation will be impeded, and swelling of the arm below will occur. The splints will be required for about four weeks. The patient should be encouraged to make small movements with his fingers and wrist from the first, and after a week or so to make slight movements of the elbow, but not enough to cause him any pain. The hand and wrist should be carried in a narrow sling, the elbow *not* being supported.

FRACTURES ABOUT THE ELBOW JOINT

The patient should be kept lying down with the elbow bent to a right angle, and supported on a pillow. A splint may be shaped to fit the back of the elbow, and very lightly bandaged on to the joint. If it is the point of the elbow bone that is broken off, a splint gives little assistance. The patient should lie on his back with the arm on a pillow, and the elbow slightly bent. The joint may be lightly bandaged. In all fractures near the elbow joint the arm may be moved about slightly, not by the patient himself, but by his friends. Such movements must take place at the joint, and not at the site of fracture, which must be steadied with one hand. The movements must be so slight as to cause no pain.

FRACTURE OF THE BONES OF THE FORE-ARM

An attempt should be made to get the broken bone into a correct position, and the arm then placed across the chest with the elbow bent to a right angle, and the thumb upwards. Two splints are necessary, one on the front of the arm, and one behind, and they must be thickly padded to fit the shape of the arm. The splints must be broader than the arm throughout, to prevent the bandages pressing on the arm between the splints, and forcing the bones together in a false position.

FRACTURE OF RIBS

Strips of broad adhesive plaster are fixed tightly over the affected side with the edges overlapping, the object being to limit the movements of the ribs in breathing; or, if plaster is not procurable, the whole chest should be bandaged firmly with broad bandages.

FRACTURE OF THE THIGH

The results of treatment of this injury by an amateur surgeon are almost certain to be unsatisfactory, but an effort may be made on the following lines: The usual deformity is shortening, due to the overriding of the fragments, and this can only be prevented by keeping up a constant extension of the limb to overcome the muscular contraction. A long splint should be made, reaching from the breast to well beyond the foot; on the outside of the injured limb a hole is bored through each end of the splint, and from the upper hole a well-padded bandage is carried between the legs, while another well-padded bandage secures the foot (above the ankle) to the lower end of the splint. By drawing these bandages tight, and gradually increasing the strain at intervals, the foot can be pulled down to its proper level. The patient will be best treated lying on blankets, or a very thin mattress on the floor, and the piece of the splint which projects beyond the foot must be steadied in a perpendicular position to prevent the leg below the break from rolling outwards. This can be done by fixing a cross piece to it, or placing a heavy box on either side. The injured limb is now secured to the splint by a bandage from the ankle to the top of the thigh, and at the upper end of the splint a few turns of bandage are carried round the chest to prevent the patient moving too freely. The extension bandages should be gradually pulled on, and shortened until the broken leg matches the other in length. After a fortnight all bandages may be relaxed somewhat, but the splint must be kept in position for six weeks, and it will be three months before the patient can walk with any freedom.

FRACTURE OF THE LEG BELOW THE KNEE

Fractures in this situation must be brought into as correct a position as possible, by drawing the lower fragment gently downwards, and endeavouring to bring the big toe into line with the inner edge of the knee-cap. Two splints will be required, one for each side, and some method of supporting the foot must be devised, or its weight may cause displacement to recur.

A *Compound Fracture* is one in which an external wound exposes the broken fragments, and may be caused either by the same external violence which breaks the bone, or the ends of the bone as they separate may be forced through the skin from within, outwards. It is a most serious injury on account of the risk of blood poisoning due to infection by germs entering from without. The external wound must be scrupulously cleaned and disinfected, and the fracture put up in splints in the usual manner. The bandages which fix the splints must not be carried over the wound, which is thus left accessible for daily dressing. Every effort must be made to keep the wound clean and sweet by the free use of antiseptics and thick absorbent dressings, which are lightly secured in place by a separate bandage, and frequently changed as long as any discharge continues.

HÆMORRHAGE

Blood is carried from the heart to every part of the body by vessels called arteries; the arteries divide into innumerable tiny vessels called capillaries; and these unite again to form the veins, which carry the blood back to the heart. Bleeding differs according to which kind of vessel is wounded.

In a small cut the capillaries only are wounded, and the amount of bleeding is trivial. If a fairly large vein is wounded the blood pours out freely, but steadily, and the blood is dark blue, purple, or bluish red in colour. When an artery is divided, the blood, which is bright red in colour, is shot out in intermittent jets, and if the vessel is a large one the jet will spout for several feet. In treating cases of hæmorrhage the amateur surgeon will have to rely entirely on pressure; and pressure properly applied will succeed in arresting nearly every case of hæmorrhage which is not so severe as to prove fatal within a few minutes. For capillary bleeding only the slightest pressure is needed. For venous bleeding fairly firm pressure may be required, applied by bandaging the wound itself, and the part of the limb immediately below the wound, with the object of compressing the vessels which are bringing the blood to the wound.

Arterial bleeding will be more difficult to arrest. A small artery may be compressed by pressure applied directly to the wound and to the part above it, but if the artery is a large one it will be necessary to stop the circulation in the limb entirely for a time, by applying a tourniquet above the wound, while the whole limb is firmly bandaged from below upwards. When the bandaging reaches the site of the wound, pads are placed in position, and firmly fixed, and the bandaging carried well above the injury. The tourniquet is now removed, and the injured limb placed in an elevated position. The patient should be kept lying perfectly quiet, and the bandages not disturbed for several days.

Every effort should be made in such a case to obtain skilled medical aid, even if such cannot arrive for two or three days. By the use of bandages as described, and, if these fail, by adding a tourniquet which is not drawn tight enough to absolutely arrest the circulation in the limb, a fatal issue may be postponed, and time allowed for a surgeon to arrive and ligature the wounded artery.

There are certain points in the body where the large vessels cross over a bone, and so may be readily compressed by the fingers in an emergency.

1. The subclavian artery crosses the first rib, behind the collar bone, but very deep pressure is needed to control the vessel.
2. The axillary artery may be easily compressed against the inner side of the humerus (the bone of the upper arm), in the armpit.
3. The main vessel of the arm may be compressed against the humerus in most of its course in thin people, but especially just above the elbow, on the inner side towards the front.
4. The radial and ulnar arteries are easily controlled just above the wrist, where their pulses are most distinctly felt.
5. The main artery of the leg (femoral) may be compressed at the middle of the groin.
6. At the back of the knee the artery supplying the leg may be controlled ; perhaps most readily by placing a pad in the bend of the knee, and flexing the knee strongly on the pad.
7. At the ankle, there are several spots where arteries may be felt beating, and so controlled at those points.

The reader should make out all these points on his own body, until he becomes quite familiar with their situation. Compression at any such point will arrest instantly all bleeding below. One person will be unable to keep up such pressure long, however, as the fingers quickly become too tired to maintain it, but a relay of assistants can control bleeding for many hours in this way, until help arrives.

A knowledge of these points is also of assistance in applying a tourniquet, *e.g.* a small stone wrapped in a handkerchief may be placed over the artery, and sufficient pressure exerted to control that vessel without entirely arresting the circulation through other smaller arteries. Bleeding may sometimes be arrested in this way, without the application of a tourniquet so tight as to stop all circulation in the limb.

Wound of the arteries of the palm, usually by a punctured wound, calls for special mention. Pressure bandaging properly applied is the best of all treatment ; but if inefficiently carried out will fail, and the patient may lose his life. The bleeding is arrested temporarily by local pressure with the fingers, while a tourniquet is placed above the elbow. The wound is then very carefully cleaned and disinfected, and a broad cone-shaped pad prepared by cutting circular pieces of gauze or lint dressings, increasing in size from a threepenny piece to a half-crown. Two pieces of stick an inch long and of the thickness of a pencil are also prepared and thinly padded. The cone-shaped pad is best applied soaked in carbolic oil. These preparations being completed, each finger must be now separately bandaged firmly ; the tip of the cone is placed on the wound and the pad increased in thickness to fill the hand, which is doubled up over the pad, and the fist firmly bandaged in that position. When the bandage reaches the wrist, the bits of padded stick are placed over the line of the two arteries above the wrist, and there bandaged on. Finally the arm is firmly bandaged up to the elbow, a light splint applied, the arm placed in a sling, and the tourniquet removed. *The dressing must not be disturbed for four days,* and as considerable pain may be complained of (especially if the fingers have not been firmly enough bandaged, and begin to swell) the patient may be given small doses of morphia. (Reduced from Jacobson and Steward's "Operations of Surgery.")

In any case of severe bleeding, when the patient becomes faint from loss of blood, the hæmorrhage ceases. Stimulants must on no account be given for faintness following the hæmorrhage; for the effect would be to stimulate the heart, and bleeding would probably recommence.

PUB

INSOMNIA, OR SLEEPLESSNESS

Insomnia occurs in tropical as in temperate climates; possibly rather more commonly in the former than in the latter; and certainly with no less ill results. The strain of tropical life is sufficiently severe, without the addition of loss of sleep, and every effort should be made to correct any tendency towards insomnia.

The chief causes of simple insomnia are the heat of the nights in the tropics, and the annoyance of mosquitoes; together with the causes which operate in any part of the world, *e.g.* mental work, anxiety, excitement; excessive use of tobacco, alcohol, tea or coffee; indigestion. Punkahs and mosquito-proof rooms, with attention to the other causes mentioned, will cure many cases of insomnia. If drugs are necessary, an occasional dose of bromide of potash may be taken; thirty grains at bedtime. But the sufferer from insomnia is ill fitted to prescribe for himself, and should seek medical advice without delay. On no account should the more powerful sleeping-draughts be taken except under his doctor's instructions.

MALARIA

Malaria, still common and severe in parts of Southern Europe, *e.g.* Italy and Greece, attains its maximum virulence only in tropical countries, where it accounts for more than half of the total sickness. For centuries this disease has been the chief factor in closing large areas of tropical Africa to civilisation; and permanent European occupation of many districts became possible only when the discoveries of Sir Ronald Ross, as to the mosquito-borne character of the disease, enabled him to devise methods for its avoidance and prevention.

The disease is so familiar to all tropical residents that a brief description of its symptoms will suffice. An attack of typical malaria is divided into three distinct stages—a cold stage, a hot stage, and a sweating stage.

The Cold Stage.—For a day or so before an attack the patient may have experienced slight indisposition: depression, loss of appetite, headache, aching pain in back or limbs; or the disease may commence abruptly, with shiverings and rigors, and a sensation of extreme cold. Headache becomes severe, especially in the back of the head and neck; aching pains all over the body increase, and there is probably some nausea and vomiting. With chattering teeth, and blue lips and fingers, the sufferer wraps himself in all the clothing he can carry; or seeks his bed and buries himself beneath a pile of blankets. In African fevers this stage is usually short (often less than one hour), and frequently missing entirely. Notwithstanding the sensation of cold, the patient's temperature is rising from the earliest moment of the attack.

The Hot Stage.—The shivering and sensation of cold (which may have been very slight or even absent) now disappear ; the skin becomes burning hot and dry ; the headache and vomiting increase in severity ; the patient throws off his blankets and with flushed face and bloodshot eyes suffers for three or four hours the most intense distress, while the temperature mounts to its maximum. The mouth and tongue are dry and furred, and cold drinks are constantly demanded. In severe cases the patient may become delirious.

The Sweating Stage.—At the height of his distress, the sufferer suddenly breaks out in a drenching perspiration, and the attack terminates abruptly. All the symptoms rapidly abate ; the temperature falls to normal ; and the patient usually sleeps for some hours, to awake feeling comparatively well. The whole attack may occupy some eight hours. At the end of that time the patient will be about again, probably hungry, and feeling little the worse for his experience.

There follows now an interval of good health ; but at the end of one to three days, unless checked by appropriate treatment, a relapse follows similar in all respects to the first ; and until the disease is arrested, relapse follows on relapse at regular intervals, until the patient's health becomes utterly ruined, and if he fortunately escapes death, he passes into a condition of chronic malaria, which will probably necessitate his removal from the country a broken invalid, as the only hope of regaining health and strength.

Such is the history of neglected malaria. Fortunately the disease may usually be arrested without great difficulty or delay by proper treatment; and by following the principles of prevention as pointed out in these pages, it is possible in the majority of instances to avoid malaria entirely. The man who wishes to make his home in tropical Africa will be well advised to give his most careful consideration to the subject of malaria. The position is exactly summarised in the title of Sir Rubert Boyce's book, "Mosquito or Man? The Conquest of the Tropical World." Europeans cannot successfully live in tropical Africa unless they reduce the numbers of the local mosquitoes.

The different forms of malaria may be classified as under.

BENIGN

1. Distinct *Ague Fits*, with well-marked cold, hot, and sweating stages, recurring every day, every second, or every third day; each attack lasting from six to twelve hours, and being succeeded by an interval of freedom from fever, during which the patient feels comparatively well.

2. *Continued or Remittent Fevers*, in which the attacks run together, the intervals being slightly marked or absent. Such attacks last for three to five days usually, ending with a sweating stage, and frequently recur once or twice during the next week.

3. *Bilious Remittent*, similar to the above, the fever running to 104 F. or 105 F., and being accompanied by violent vomiting. The skin and the whites of the eyes are discoloured to a saffron yellow, commonly spoken of as "jaundice." In a severe case of bilious remittent fever, the urine is often scanty and dark, and such cases are frequently mistaken for black-water fever.

A routine treatment which will be invariably successful in all the above is: three grains of calomel, followed by a dose of Epsom salts to clear the liver and bowels; copious drinks of hot tea without milk, and plenty of blankets to induce perspiration; and five grains of quinine, preferably in solution or powder, three times a day until the temperature is normal. If headache is severe, and the patient's skin continues hot and dry, five or ten grains of phenacetin is occasionally useful, but is not usually necessary, and in Africa no drug is so much abused as phenacetin.

When the temperature is normal, and the patient begins to feel well again, he should remember that his disease is only arrested, but not cured. To prevent relapses, and especially to avoid getting into a state of chronic malarial infection, so dangerous in Africa as predisposing to an attack of black-water, the quinine treatment should be continued for at least two months. For the first week ten grains per day; later five grains per day, with an extra five-grain dose once a week. Or ten grains may be taken twice a week, after the first week's dosage of ten grains daily. Even two months of this treatment will be insufficient to completely eradicate the malarial infection in a small minority of cases; and occasional doses of quinine may wisely be taken up to the end of the fourth month.

MALIGNANT MALARIA (" Pernicious Malaria ")

1. High fever, the temperature rising to 106° F. or over, the patient possibly rapidly becoming unconscious, and dying within a few hours.

2. Unconsciousness (coma), with a temperature perhaps not about 103° F. Delirium and convulsions occasionally also occur.

3. Malaria complicated with dysenteric symptoms.

4. Malaria complicated with chest symptoms (malarial pneumonia).

Treatment.—All the above forms of malaria are highly dangerous and require prompt treatment. There is not a minute to lose, if the patient is to have a chance for his life. High temperature must be brought down by cold baths, and large doses of quinine used to check the disease.

The cold bath is called for when the temperature in the mouth or rectum reaches 106° F., and should be discontinued only when the temperature has fallen to 103° F. The temperature must be taken constantly while the patient is in the bath, and he must be removed with a temperature of 103 F., as a further fall of another degree or two will take place after removal, and there is a danger of collapse if his temperature is forced too low. The bath must be repeated as often as the temperature mounts again to 106° F. If a bath is not procurable, the patient may be stripped naked, and wrapped in a sheet only, which is kept well soaked in water. The effect is the same as the bath, and the same precautions are necessary, but the temperature cannot be reduced so quickly by a wet sheet as by a bath. Fanning the patient as he lies in the wet sheet will hasten the fall in temperature.

Quinine in Malignant Malaria.—In malignant malaria absorption from the stomach is imperfect. It is useless to give sugar-coated tabloids. Quinine in solution may be absorbed, provided there is no vomiting, but it is better to give ten grains of quinine in solution, by rectal injection, every hour until the patient's condition improves. The ordinary sulphate of quinine may be dissolved in water by the aid of a few drops of any mineral acid, or addition of half its own weight of tartaric acid, but it is well to be provided with one of the soluble salts of quinine, such as the bi-hydrochloride of quinine, which is soluble in its own weight of water.

The absorption of quinine solutions from the bowel, however, requires some time, and time is the all-important factor in the treatment of malignant malaria. It is far better if the quinine solution be injected with a hypodermic syringe into the substance of the muscles of the buttock, when it is immediately absorbed into the blood. Every person residing in highly malarious districts ought to possess, and know how to use, this little instrument. The dose of quinine intramuscularly should be ten to fifteen grains, repeated if necessary after some hours. When the patient's condition has become less dangerous, the quinine may be given by the mouth or rectum, as above. After recovery from malaria, tonics such as the iron and arsenic pill will be required for some weeks.

THE CAUSE OF MALARIAL FEVER

Malarial fever is caused by the presence in the blood of man of small animal parasites, of which there are at least three distinct varieties accounting for the different types of illness produced as classified above. Taking as an example a case of illness in which attacks of fever occur every other day, "tertian ague," it will be found that the life history of the parasite in the blood corresponds with the illness of the sufferer. By taking drops of blood from his finger at regular intervals throughout forty-eight hours from the commencement of an ague fit, it may be seen under the microscope that each parasite grows for forty-eight hours, and then splits up into a number of descendants ; each of which enters on its brief life of forty-eight hours, and at the end of that time produces the next generation. It will be noted also that all the parasites are of the same age, and that therefore they will all produce the following generation at the same time. It is this regularity in the time of division of the parasites that marks the period of each succeeding attack of fever, the actual cause of the illness being the waste poisonous products (toxins) thrown off by the parasites in the act of splitting up into the next generation. The effect of the dose of toxin soon passes off, and there is usually time for the patient to enjoy one day of freedom from illness before the next division of parasites with the resulting attack of fever is due. In the more severe types of continued fever the periodicity of the disease is still usually apparent in the fluctuations of temperature. Each succeeding generation of parasites in the blood accounts, then, for each recurring attack of malarial fever; but how did the original ancestor of the parasites get into the patient's blood, and how are some of them to be transferred to the next victim? It is obvious the parasite cannot escape from the interior of the blood-vessels of man by its own powers, and would eventually perish there; but Nature always safeguards the interests of her creatures, and the agent of which she makes use in this instance is the mosquito.

THE PARASITE IN THE MOSQUITO

If a suitable variety of mosquito be fed on the blood of a person suffering from malaria, some of the parasites are sucked up into the insect's stomach, where they undergo certain stages of development, and finally are able to pass to the salivary glands of the mosquito. So soon as the mosquito now bites another person the parasites pass with the insect's saliva into the blood of the person bitten, and he will presently suffer from an attack of malaria.

The whole process of development in the mosquito requires about a week before the insect becomes infective; and the double life history of the parasite is a beautiful provision of Nature to allow the tiny creature to carry on its existence. It would die out at once if it could only live in man alone, or in the mosquito alone; but by passing backwards and forwards from one to the other its safety is ensured.

THE PROOF THAT THE PRESENCE OF THE PARASITE IN THE BLOOD OF MAN IS THE CAUSE OF MALARIAL FEVER

1. The parasite can be found in every case of malaria; and conversely, if the parasite is present in human blood the person has malaria at the moment, or is about to develop it.
2. The life history of the parasite in the blood of man corresponds in time to the periodic recurrences.
3. The disease can be directly inoculated by subcutaneous injection of malarial blood into a healthy person, when after the end of about eight days the parasites can be found in the blood of the inoculated person, and fever will follow.
4. Treatment by quinine kills the parasite, and cures the illness.

THE PROOF THAT THE MOSQUITO CONVEYS THE PARASITE TO MAN

1. By dissections of mosquitoes it can be shown that the parasite develops in the insect, and finally reaches the salivary glands, so that the insect is

capable of injecting the parasite into any person it bites.

2. By actual experiment it has been proved that a mosquito fed on malarial blood is capable, after a week or so, of causing malarial fever in the persons whom it is allowed to bite.

THE PROOF THAT MALARIAL FEVER IS CONVEYED TO MAN BY MOSQUITOES ALONE

If people are carefully protected from the bites of mosquitoes they never get fever.

In 1900 two gentlemen lived for three months near Rome, at a place which was highly malarious. They took no quinine and no precautions of any kind, except to retire from sunset to sunrise into their mosquito-proof hut. They had no fever, although nearly all the people living near them were sick with malaria. At the same time mosquitoes were fed on the blood of persons suffering from malaria, and the mosquitoes were sent in suitable cages to London, where they were allowed to bite two gentlemen who had never been out of England, and both of whom presently developed malarial fever. These experiments, which were devised by Sir Patrick Manson, completed the proof of the theory that mosquitoes, and mosquitoes only, convey the disease to man.

MOSQUITOES

Fortunately it is not every kind of mosquito that can carry malaria, but only those belonging to the sub-family Anophelinæ; and these have some special characteristics and habits, which are important.

All mosquitoes lay their eggs on water. The egg hatches out into a larva or "wriggler," corresponds to the caterpillar stage of butterflies; the larva grows into a shrimp-shaped creature called a "pupa," which corresponds to the chrysalis stage of butterflies; and from the pupa emerges the adult mosquito.

The larvæ of Anopheline mosquitoes can be recognised from all other varieties, as they float flat on the surface of the water instead of hanging downwards by a tail-like breathing-tube. The adult Anopheline mosquito can be recognised by the following characteristics:

1. By its shape, which is a straight line from end to end, while the other varieties are bent, or "hump-backed."

2. By its position when resting, which is at a marked angle with the surface on which it stands, with the head pointing towards that surface.

3. In most cases by the distinctly spotted wings.

Anopheline mosquitoes have two very constant habits, which are of great importance in considering what can be done to prevent them spreading fever.

1. They almost invariably breed in small pools or small sluggish streams, so that it is easy to discover their breeding-places with the object of destroying the larva by drainage or paraffin.

2. They almost invariably feed at night, so that a mosquito-proof bedroom offers almost complete protection against malaria.

THE PREVENTION OF MALARIA

The great majority of the attacks of malarial fever may be prevented if we remember that the disease is conveyed only by the bites of infected mosquitoes; and although residents and travellers in malarious countries may not be able to escape malaria entirely, they may easily reduce their attacks to a minimum. The following are the main principles which should be followed for this object :

1. TO GET RID OF MOSQUITOES BY PREVENTING THEM BREEDING NEAR TOWNS OR HOUSES

(This is dealt with under "Avoidance of Mosquito Bites.")

2. BY ATTACKING THE PARASITE

If there are no sick people in a neighbourhood, the mosquitoes will not become infective, but will remain harmless. All cases of malaria should be treated over a lengthy period with quinine.

3. BY PREVENTING MOSQUITOES BECOMING INFECTIVE

All fever cases should be nursed under mosquito nets, to prevent mosquitoes having access to them ; and as above mentioned, all cases of fever should be carefully treated. Further, quinine should be issued free to all poor people, and such natives as will give the drug to their children when sick.

4. TO PREVENT MOSQUITOES BITING THE HEALTHY

See "Avoidance of Mosquito Bites." Anopheline mosquitoes, feeding almost entirely at night, and being of a timid disposition, rarely bite people except when asleep. A mosquito-proof bedroom, or the careful use of a bed net becomes then the most important precaution that can be adopted with the object of escaping malaria.

Sportsmen and travellers should invariably be provided with a mosquito proof tent, or at least a mosquito-proof camp bedstead.

5. THE SEGREGATION OF NATIVES

No natives except such as are absolutely necessary for domestic service should be allowed to live near European houses. Kafir children are almost always infected with malaria, although they may show no sign of illness; and thus a constant source of infection of mosquitoes is always at hand, with the result that the neighbouring Europeans suffer.

6. QUININE AS A PREVENTATIVE

Five-grain doses of quinine may be taken without ill effect over long periods, and may be relied upon to prevent malaria almost entirely. Any attacks which might occur would probably be slight, and easily cured by an increased dosage of quinine. This method of prevention is especially suitable for persons who visit a malarious country for a short period, *e.g.* travellers or sportsmen, who are not able to carefully follow the other precautions mentioned above. But for permanent residents in a fever country, the first object should be to get rid of mosquitoes, with the use of a mosquito-proof bedroom as a second line of defence.

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PNEUMONIA, OR INFLAMMATION OF THE LUNGS

This disease is not uncommon in tropical countries, and occurs occasionally as an epidemic among natives in East Africa. It may be recognised by its sudden onset, high fever, quick pulse and breathing (the respiration rate rising perhaps to 40 per minute), pain in the chest on breathing or coughing, short cough, and the expectoration of scanty, thick mucus, which often contains some blood, or is blood-stained to a rusty red colour.

The most important part of the treatment is to afford the patient careful nursing. He should be placed in bed in a well-ventilated room, and fed carefully on small but frequent cups of milk, beaten eggs, broths and beef tea. Presently the free use of stimulants, champagne or brandy, will be required. If the patient's strength can be maintained for about nine days, the disease will run its course, and the most skilled medical attention can do nothing to cut short the attack, but is only directed to tiding the patient over the time of the acute symptoms.

During the first two or three days, while the patient is still strong, sweating may be encouraged by copious hot drinks, and the bowels should be kept freely open. The mouth should be kept clean by washing with weak Condy's fluid, and cleaning the teeth and lips with a swab of cotton wool moistened with glycerine and water and boric acid. If there is much pain, an occasional poultice gives some relief; but constant poulticing is to be deprecated, especially when the patient is weakening towards the end of the illness. Of medicines, the most generally useful is strychnine, which may be given in small doses from the commencement of the illness (five drops of the tincture of Nux Vomica three times a day). If the patient cannot sleep, one dose of Dover's powder may be given on the second evening (ten grains), but later on in the disease it is risky to use any drug containing opium, and if a sleeping-draught is required, fifteen grains of bromide of potash may be tried.

In a case of pneumonia in the tropics, it is always wise to give two ten-grain doses of quinine during the first couple of days, as the disease sometimes is malarial in its origin ; and such a typical " malarial pneumonia " may sometimes be promptly relieved by quinine. The same remark is true of some attacks of dysentery, and of convulsions in children, as well as of many so-called " sunstrokes " mentioned elsewhere. In fact, in any acute illness occurring in a malarious district, the possibility of it being malaria, in one of its many manifestations, must not be forgotten. If there is the slightest doubt as to the nature of an illness, a few doses of quinine can do no harm, and to omit giving them may cost the patient's life.

RELAPSING FEVER, OR TICK FEVER

There occurs all over tropical and subtropical Africa a tick which feeds chiefly on human beings, and which may be recognised by the following characteristics: It is, when full grown, a large, oval-shaped tick, yellowish brown in colour, or dark brown when full of blood ; the skin of the back is nowhere smooth, being covered with tiny dimples and corrugations, and on looking at it from above, the head is invisible, being concealed by the overhanging anterior end. It is called in the Transvaal the " Tampan " ; in the Inhambane district the native name is " Marota " ; in the Zambesia Valley it is known as the " Carapata " ; in the northern Moçambique districts it is called the " Upa," and in the Ibo district the " Fiõn." Its habits resemble those of the common house bug. It lives in cracks in the wall or floor, or buries itself in the dust of compounds, coming out to feed at night ; and on biting human beings it conveys the disease known as relapsing fever, or tick fever.

The disease is an abrupt fever, with high temperature, aching pains, vomiting, slight cough, and occasionally fleeting rashes on the chest and palms of the hands. On the second or third day the attack ends rapidly with some perspiration, occasionally with a drenching perspiration. The patient now has an interval of from three to eight days of good health, when the disease recurs with all its original severity, and runs a similar course. This history is repeated until a period of two to three months has elapsed, and upwards of a dozen attacks of fever may have been suffered. Each attack of fever is little, or not at all milder than those preceding it, but the intervals between the attacks tend to become longer. The disease is rarely fatal, but when it has run its full course the patient is often left weak, anæmic, and practically invalided. He now has gained, however, a certain degree of immunity, and any subsequent attacks are likely to be slight both in severity and duration; thus natives, who no doubt suffer from the disease in childhood, rarely show in later life more than one or two slight relapses, whenever their immunity breaks down. The disease is so similar to malaria in its clinical manifestations that it is nearly always mistaken for it, even by medical men, and only a microscopic examination of the blood can give an exact diagnosis. Points which may serve to suggest tick fever are: the presence of the tick, or the absence of Anopheline mosquitoes in any locality; the intervals between the attacks are less regular than those in malaria; much cough or rash; and especially the failure of quinine to control the disease.

There is no treatment which has the slightest value in cutting short the disease. Careful nursing is indicated, and stimulants may be required at the end of each relapse. Prevention is simple. Houses and compounds should be cleared of ticks by the use of paraffin washing, or fumigation ; and with cement or plaster all crevices in walls or floors should be filled up. Camping-grounds should be selected away from native villages, and old camping-grounds on regular routes should be studiously avoided. To sleep in native huts is to invite the disease. Owing to the nocturnal habits of the insect, the use of a mosquito net gives complete safety against its attacks.

RHEUMATIC FEVER

Rheumatic fever is not uncommon in the tropics, and in many cases appears to follow directly on a chill, such as sitting in damp clothes, after sunset, when the temperature is falling rapidly. The disease is ushered in with shivering, the fever mounts rapidly, and within a few hours pains in the joints become the pronounced feature of the illness. There is usually profuse sweating, with a sour, offensive odour. The joints are swollen, hot and red, and exquisitely painful to move and tender to touch. Several joints are usually attacked one after another, and frequently the pain subsides in one as another is affected. Delirium may occur.

The disease is possibly hereditary, and one attack predisposes to another.

Treatment.—The patient should lie between blankets, and is best fed on milk only. The joints should be wrapped in cotton wool or flannel. Salicylate of soda is given in twenty-grain doses every two hours, until the pain is relieved, and afterwards every four hours until the temperature falls to normal.

SKIN DISEASES

" PRICKLY HEAT "

With its well-known eruption and itching is caused by excessive perspiration; many persons are quite unable to wear flannel on account of this troublesome disease, alleging that the irritation of flannel invariably produces a crop of prickly heat.

The total amount of fluids consumed should be reduced as much as possible, in order to limit perspiration; and exercise should be avoided during the heat of the day.

Sponging with weak carbolic lotion 1 in 50 usually relieves the itching, and a toilet dusting powder should be used freely. Ammonia in the bath and sponging with bay rhum and water are recommended by some experienced residents.

DHOBIE ITCH (WASHERMAN'S ITCH)

So called from the popular belief that the infection is conveyed by clothes on returning from the washerman.

This term is used to describe a raw, inflamed, itching condition of the skin of moist parts, chiefly the inside of the thighs and the armpits. The disease is very troublesome, and, if severe, causes great inconvenience and suffering. It usually improves in cold weather, to break out again the following summer. The disease is very resistant to treatment, and skilled advice will be necessary in bad cases. Mild cases may be benefited by strict cleanliness, careful daily washing in warm water, and careful drying, followed by the use of a 10-per-cent. sulphur ointment, or free application of a zinc and boric acid dusting powder.

RINGWORM

Many varieties of ringworm are met with in the tropics, some of them spreading over large areas of the body. Neither the diagnosis nor the treatment of these conditions is simple, but in the absence of skilled advice the patches may be painted with the liniment of iodine.

PARASITIC SKIN DISEASES

THE "JIGGER FLEA"

This little creature penetrates and completely buries itself in the skin, where it causes intense itching and irritation, and occasionally sets up a troublesome sore. The best treatment is to set a native to work with a needle, when he will almost invariably succeed in removing the insect entire. If the insect is broken up in the skin, healing will not take place without ulceration.

"Jiggers," like other fleas, breed in the dust on the floors of houses, and in sandy compounds; houses in jigger-infested neighbourhoods must be kept clean by daily sweeping, and the floors should be washed with any of the carbolic preparations, such as Jeyes' Fluid, or Izal solutions; compounds may be watered with similar preparations. Particular attention should be paid to fowl-houses and pens for domestic animals. The use of mosquito boots is a certain protection.

THE SKIN MAGGOT

This disgusting creature is the maggot of a fly of the blue-bottle type. The female lays her eggs on the skin or clothes of human beings (or more commonly on animals, especially smooth-haired dogs). The maggot, on hatching out, immediately penetrates the skin, where it gives rise to little inconvenience for some days; but later, a small swelling is formed, rather like a boil, in the centre of which is a small hole through which the creature will emerge when fully grown; and the swelling finally becomes inflamed and painful. If left alone, the larvæ will emerge in about a week, but they can usually be squeezed out without much difficulty, when the swelling is first noticed; or failing this, the swelling can be opened, and the contents emptied. Natives use a dressing of chewed tobacco, which causes the worm to leave its burrow.

SNAKE BITE

The treatment of snake bite is guided by endeavours to secure the following objects:

1. To prevent or delay the absorption of the poison into the general circulation.

2. To destroy or remove the poison at the site of the bite.

3. To destroy the poison which has already been absorbed into the circulation.

1. The absorption of the poison is prevented or delayed by the immediate application of a strong ligature. The ligature must naturally be placed above the bite, *i.e.* nearer to the body. Anything does for a ligature—a cord, a handkerchief, or a piece torn out of a shirt. No time must be lost. The ligature must be tight, and should be twisted with a stick. It is useless to put a ligature anywhere on the forearm, or on the calf, as there are two bones in these parts of the limbs, and no ligature can control the circulation in the vessels between the bones. In the case of a bite on the finger, the ligature may be placed around the base of the finger, provided there is room to get the

ligature well above the bite; but if the hand is bitten, the ligature must be above the elbow. The same remarks apply to the toes, and for a bite on the foot the ligature must be above the knee.

Every half-hour or so the ligature may be relaxed entirely for a couple of seconds to avoid the risk of gangrene.

2. Removal of the poison at the site of the bite.

It must be remembered that a snake's fang is a hollow curved needle, and that the poison is ejected from the tip. Thus the external puncture marks are not necessarily immediately over the spot where the poison lies, and unless the position of the snake's head when striking, and length of fangs are known, the situation of the poison can only be guessed at. A free use of the knife therefore becomes necessary, and the whole of the suspected area should be entirely cut out, going fairly deep. In the case of a bite on the finger the flesh should be removed down to the bone. The resulting wound should next be washed with a strong solution of permanganate of potash, which drug possesses the power of neutralising any venom with which it can be brought in contact.

A less drastic and less reliable method is to make two or three deep incisions into the area in which the poison is supposed to be lying, and then to rub in solid crystals of permanganate of potash. But unless the incisions happen to strike the exact spot where the poison lies, the drug may fail to reach the venom; and therefore the first-mentioned method of excision is much safer, if a person is present with the nerve to perform the operation.

3. To destroy poison already absorbed into the circulation can only be attempted by the injection subcutaneously of anti-venom serum. This method of treatment is still far from perfect, particularly

for Africa, owing to the fact that no anti-venom is at present procurable specially prepared from African snakes. Anti-venoms prepared from Indian snakes can be bought, however, and these have no doubt some effect against the bites of African snakes. The writer always carries when on the veld a phial of anti-venom and a serum syringe, and believing this remedy to have some value, would always use it in a case of snake bite, but at the same time would place more reliance on the methods of ligature and excision. If possible the serum should be injected directly into one of the small veins showing under the skin, *e.g.* in the forearm. Small doses of alcohol may be given, and the patient may lie down, and be kept warm. Walking the patient about, keeping him awake, giving enormous doses of brandy or ammonia, and sucking the puncture wounds (all methods which are popularly supposed to be of value) are useless or actually harmful.

SPRAINS

A sprain is an injury to the ligaments of a joint caused by a wrench, and is characterised by loss of power, pain, and swelling. The common joints affected are the wrist and ankle, and often it is difficult to ascertain whether the injury is not a fracture, especially if the joint is already swollen. If there is any doubt, it should be treated as a fracture until the swelling has gone down and it becomes possible to make out the nature of the injury.

The best application for a sprain is a cold lotion, which may be simply cold water constantly renewed, or an evaporating lotion made by adding methylated spirit to water in the proportions of about one to ten parts. When the pain and swelling have subsided, the joint should be massaged to remove stiffness.

ACUTE SUNBURN

Europeans who have indiscreetly exposed themselves to direct tropical sunlight occasionally suffer severely from sunburn. Open-air midday bathing, or long journeys on horseback or in uncovered carts while wearing thin white clothing are the usual occasions.

Large areas of the body, as the face and neck, or the whole of the back, may be affected, and the pain may be severe enough to confine the sufferer to bed for two or three days. The affected skin is red, hot, and swollen, and a burning pain is complained of, and in bad cases the skin may break into blisters and oozing cracks. The condition is caused not by the heat rays, but by the actinic rays, as mentioned elsewhere, and may be prevented by the use of red clothing or veiling. For treatment, rest in bed may be necessary to avoid the irritation of clothing or further exposure to light ; boric ointment may be applied, and in severe cases a lead lotion will give relief (strong solution of lead acetate, two teaspoonfuls to one pint of water).

SUNSTROKE

An acute attack of sunstroke is characterised by sudden onset during or shortly after prolonged exposure to the direct rays of the tropical sun, by complete insensibility, deep or noisy breathing, flushed face, and very high temperature. About 20 per cent. of such cases end fatally. The writer is not convinced that such attacks of sunstroke ever occur in South or Central Africa. Attacks of this nature are usually malignant malaria, and may be treated as such ; in other countries—supposing the diagnosis of sunstroke to be made certainly—the treatment of cold baths remains the same as in malignant malaria. Minor forms of sunstroke occur in some parts, and may be divided into two classes.

1. HEAT EXHAUSTION

The patient feels weak, faint, or actually suffers from fainting fits, following exposure to the sun, especially if also fatigued. The same illness may occur in shade temperatures, as in an engine room. The patient should be placed lying down in the open air, in as cool and shady a situation as possible. Clothing should be unfastened, and a handful of cold water dashed over the face and chest.

2. MILD SUNSTROKE

The chief symptom is a severe headache, accompanied by slight fever, hot dry skin, throbbing pulse, and bodily and mental fatigue. The condition may last for a few hours, or one to two days, and may be followed by a tendency to headaches, or some impairment of the mental faculties. The treatment should be rest in a quiet, cool, shady room, with cold bandages applied to the head and sponging or bathing to reduce temperature, if necessary ; milk diet ; no alcohol. A dose of bromide of potash may be useful to induce sleep, if the patient is restless.

TOOTHACHE

The proper treatment of toothache is by stopping or extraction, but the following measures will sometimes relieve pain temporarily: The cavity of a decayed tooth may be cleared of debris, and a tiny drop of pure carbolic acid inserted on a plug of cotton wool. Be careful to avoid any excess of acid, or burning of the tongue and cheek may result. Powder of bicarbonate of soda placed in the cavity often succeeds in relieving pain. For pain at the root of a tooth, which feels sore on biting, a little tincture of iodine may be painted along the gum, the cheek being held away until the iodine dries; and if this fails, and the process goes on to the formation of a "gumboil," hot fomentations—strips of lint wrung out of hot water—may be placed inside the mouth, between the cheek and gums.

ULCERS

Ulcers of various kinds are very common in tropical countries, affecting chiefly the back of the hand and wrist and the lower legs and ankle. Many of them commence by some slight scratch or abrasion, or follow on the bites of insects. A taint of scurvy due to lack of fresh vegetables is often a factor in their production. If simple treatment by a boric acid or iodoform dressing fails to cure—and this is usually the case—more energetic measures must be adopted. The whole surface may be rubbed over with a small piece of cotton wool, just moistened with pure carbolic acid, followed by a dressing as above; or a wet dressing may be applied, and kept constantly moist with 1 in 1,000 solution of corrosive sublimate. All shreds of dead skin should be trimmed away at the edges, as the morbid process spreads by undermining the edges, and is here protected from the effects of the disinfectant dressings.

The general health should be attended to, and the patient placed under favourable conditions as regards diet and mode of life. Lime juice is useful when vegetables are scarce.

WOUNDS

Small clean wounds require no more than an antiseptic dressing and a bandage. If a wound is large the edges must be brought together and secured by strips of plaster or by stitching. Stitching a wound requires little learning ; put the needle through enough depth of skin to prevent the stitch tearing out, and tie each stitch separately. The stitches should be about half an inch apart, and in the case of a large wound a gap may be left at the most dependent spot to allow discharges to drain freely away. If a wound is dirty, it must be first washed with a disinfectant (permanganate of potash solution, or 1 in 40 carbolic lotion), and all particles of dirt carefully removed. Ragged wounds must be carefully brought together in all directions, every shred of skin being restored to its original position. If there is much hæmorrhage, the artery above the wound must be compressed while these operations are being carried out. The wound is then dusted with iodoform or boric acid powder, dressings applied, and bandaged tight enough to keep bleeding within reasonable limits.

MEDICAL OUTFIT

The following list includes all the appliances and drugs mentioned in the preceding pages, and represents the minimum of outfit necessary for treating the conditions described herein:

LIBRARIES

A. APPLIANCES

Small abscess knife.
Dressing scissors.
Large rubber enema syringe (Higginson's).
Small glass enema syringe for injection drugs.
Surgical needles (curved and straight) and ligatures.
Small measure glass.
" All glass " hypodermic syringe.
" All glass " serum syringe.

B. DRESSINGS AND EXTERNAL APPLICATIONS

Assorted bandages.
Lint.
Cotton wool.
Medicated gauze, iodoform, or cyanide.
Adhesive plaster.
Mustard leaves.
Olive oil.
Vaseline.
Boric ointment.
Sulphur ointment.
Carbolic acid (pure).
Iodoform.
Condy's fluid (or instead solutions made of permanganate of potash crystals).
Toilet dusting powder and zinc oxide powder for dusting.

Boric acid (Burroughs Wellcome & Co. " Soloids ") and powder.
Corrosive sublimate (Burroughs Wellcome & Co. " Soloids ").
Zinc sulphate (Burroughs Wellcome & Co, " Soloids ").
Liniment of iodine and tincture of iodine.
Strong solution of acetate of lead.
Methylated spirit.

C. MEDICINES FOR INTERNAL USE

Calomel.
Castor oil.
Epsom salts, or Glauber salts, or Seidlitz powders.
Cascara Sagrada.
Compound pill of colocynth and hyoscyamus.
" Dover's powder."
Ipecacuanha powder.
Extract of Cassia Beareana.
Bromide of potash.
Chlorate of potash.
Quinine sulphate.
Quinine bihydrochloride.
Tincture of opium (" laudanum ").
Chlorodyne.
Tincture of Nux Vomica.
Salicylate of soda.
" Anti-venom " serum for hypodermic injection.

D. FOR SANITARY PURPOSES

" Jeyes's fluid " or " Izal."

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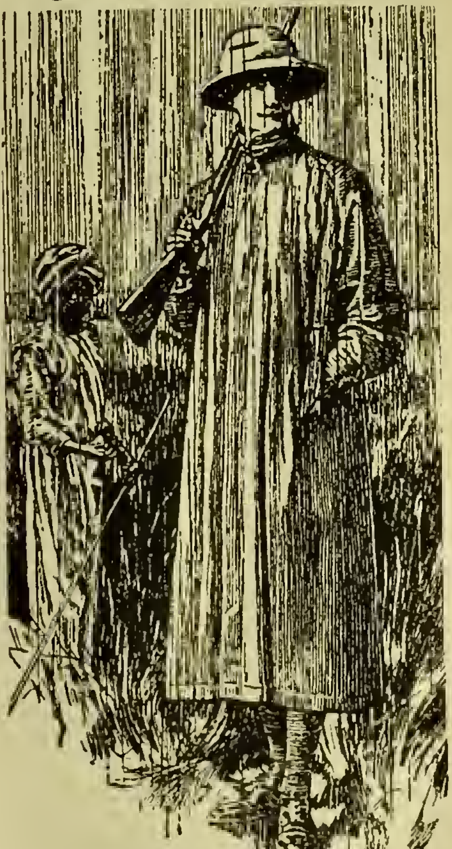

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